

**MONETARY POLICY AND ECONOMIC GROWTH: LESSONS FROM EAST
AFRICAN COUNTRIES**

by

ENOCK TWINOBURYO NYOREKWA

Submitted in accordance with the requirements
for the degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject

ECONOMICS

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF NM ODHIAMBO

JULY 2017

DECLARATION

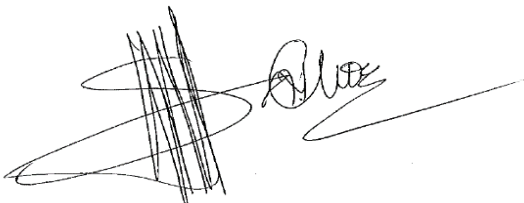
Name: ENOCK TWINOBURYO NYOREKWA

Student number: 55794882

Degree: DOCTOR OF LITERATURE AND PHILOSOPHY in the subject ECONOMICS

MONETARY POLICY AND ECONOMIC GROWTH: LESSONS FROM EAST AFRICAN COUNTRIES

I declare that the above dissertation/thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

A handwritten signature in black ink, appearing to be 'E T Nyorekwa', written over a horizontal line.

SIGNATURE
(E T Nyorekwa)

28/07/2017

DATE

ABSTRACT

This study empirically examines the impact of monetary policy on economic growth in three East African countries (Uganda, Kenya and Tanzania). The role of monetary policy in promoting economic growth remains empirically an open research question, as both the empirical and theoretical underpinnings are not universal, and the results remain varying, inconsistent, and inconclusive. This study may be the first of its kind to examine in detail the impact of monetary policy on economic growth in Uganda, Kenya and Tanzania – using the autoregressive distributed lag (ARDL) bounds-testing approach. This study used two proxies of monetary policy, namely, money supply and interest rate, to examine this linkage. The results were found to differ from country to country and over time. The Uganda empirical results reveal that money supply has a positive impact on economic growth, both in the short run and in the long run. However, interest rate was found to have a positive impact on economic growth only in the short run. In the long run, interest rate has no significant impact on economic growth. In Kenya, both short-run and long-run empirical results support monetary policy neutrality, implying that monetary policy has no effect on economic growth – both in the short run and in the long run. The results from Tanzania also reveal no impact of monetary policy on economic growth in the long run – irrespective of the proxy used to measure monetary policy. However, the short-run results only reveal no impact of monetary policy on economic growth only when the interest rate is used as a proxy for monetary policy. When money supply is used to measure monetary policy, a negative relationship between monetary policy and economic growth is found to dominate. Overall, the study finds that monetary policy is only relevant for economic growth in Uganda and only when money supply is used as monetary policy variable. Therefore this study recommends a money supply based monetary policy framework for Uganda. The study findings also suggest that monetary policy may not be a panacea for economic growth in Kenya and Tanzania.

KEY WORDS

Monetary Policy, Money Supply, Interest Rate, ARDL Bounds Testing Approach, Cointegration, Uganda, Kenya, Tanzania, Economic Growth, Long Run, Short Run.

DEDICATION

To my optimal choice – My wife Ruth Atuhire Nyorekwa and our beloved sons Ethan Friedman Atworeka and Emmanuel Keynes Ayoreka

“You all optimise my social welfare function significantly”

ACKNOWLEDGEMENT

This thesis is one of the daunting tasks I have had to undertake in my life, but the process has also been intellectually stimulating and professionally an enriching experience. I remain deeply indebted to the following:

- The Lord Almighty who remains amazingly kind to me. The doctoral scholarship by UNISA – cemented a complete scholarship journey through my entire university career.
- Prof. N.M. Odhiambo for the unnerving support during the study period. The quality assurance and building critique was of positive sum effect.
- My wife Ruth Atuhaire Nyorekwa who has had to deal with my divided attention over the years but still provided moral support to me.
- UNISA administrative support- in particular Ms. M. Mokgele from the Department of Economics and Ms. L. Brown from the UNISA Library.
- Dr. S. Nyasha for a meticulous and value adding review and guidance.
- Ms. A. K. Olusola (also a finalising Doctoral fellow at University of Pretoria) for the heads up on the Doctoral opportunity but also enticing guidance and review along the gruelling journey.
- Fellow UNISA Doctoral colleagues – Mr. T. Chirwa and Mr. B. Muyambiri, also former colleagues at the African Economic Research Consortium Joint Fellowship for Electives at Master's Degree level. Your cooperation was impeccable.
- Editors and reviewers of various internationally recognised journals that have published (or accepted for publication) numerous articles emanating from this thesis, for their input. These journals include: *International Journal of Sustainable Economy*; *Journal of Applied Economic Sciences*, *Contemporary Economics*, *Journal of Central Banking Theory and Practice* among others.

All the views and any shortcoming of this study, including errors and omissions are entirely mine, and should not be attributed to anyone.

TABLE OF CONTENTS

DECLARATION	i
ABSTRACT	ii
KEY WORDS.....	iii
DEDICATION	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES	x
LIST OF FIGURES	xii
ACRONYMS.....	xiv
CHAPTER ONE	1
1. INTRODUCTION.....	1
1.1 Background to the Study	1
1.2 Statement of the Problem.....	4
1.3 Objectives of the Study	6
1.4 Hypotheses of the Study	6
1.5 Significance of the Study	6
1.6 Organisation of the Study.....	7
CHAPTER TWO.....	8
2. MONETARY POLICY AND ECONOMIC PERFORMANCE IN UGANDA.....	8
2.1 Introduction.....	8
2.2 Monetary Policy Regime and Economic Performance in Uganda (1962-1986).....	9
2.3 Monetary Policy Reforms and Economic Performance in Uganda (1986-2014).....	13
2.4 Financial and Economic Structure of Uganda	24
2.4.1 Exchange Rate Regime and Capital Account of Uganda.....	27
2.5 Challenges Facing Monetary Policy Effectiveness in Uganda.....	30

2.6 Conclusion.....	38
CHAPTER THREE	40
3. MONETARY POLICY AND ECONOMIC PERFORMANCE IN KENYA.....	40
3.1 Introduction.....	40
3.2 Monetary Policy Regime and Economic Performance in Kenya (1963-1985)	40
3.3 Monetary Policy Reforms and Economic Performance in Kenya (1986-2014)	50
3.4 Financial and Economic Structure of Kenya.....	62
3.4.1 Exchange Rate Regime and Capital Account of Kenya	69
3.5 Challenges Facing Monetary Policy Effectiveness in Kenya	71
3.6 Conclusion.....	80
CHAPTER FOUR	82
4. MONETARY POLICY AND ECONOMIC PERFORMANCE IN TANZANIA	82
4.1 Introduction.....	82
4.2 Monetary Policy Regime and Economic Performance in Tanzania (1961-1986)....	82
4.3 Monetary Policy Reforms and Economic Performance in Tanzania (1986-2014) ..	89
4.4 Financial and Economic Structure of Tanzania	98
4.4.1 Exchange Rate Regime and Capital Account of Tanzania.....	99
4.5 Challenges Facing Monetary Policy Effectiveness in Tanzania.....	101
4.6 Conclusion.....	106
CHAPTER FIVE	107
5. LITERATURE REVIEW	107
5.1 Introduction.....	107
5.2 Monetary Policy and Economic Growth: A Theoretical Framework.....	107
5.2.1 NeoClassical Monetary Theory	108
5.2.2 Keynesian Theory of Money.....	110
5.2.3 Monetarism	112
5.2.4 NeoClassical Growth Theory.....	114

5.2.5 New Classical Model.....	115
5.2.6 New Keynesian Model	118
5.2.7 New Consensus Model	120
5.3 Monetary Transmission Mechanisms	121
5.3.1 Interest Rate Channel	121
5.3.2 Asset Price Channel.....	123
5.3.3 Exchange Rate Channel	124
5.3.4 Credit Channel	125
5.3.5 Expectations Channel	126
5.4 Monetary Policy and Economic Growth: A Review of Empirical Literature	129
5.5 Conclusion.....	143
CHAPTER SIX	144
6. ESTIMATION TECHNIQUES AND EMPIRICAL MODEL SPECIFICATION.....	144
6.1 Introduction.....	144
6.2 Empirical Model Specification.....	144
6.2.1 Theoretical and Empirical Underpinnings of the Model	145
6.2.2 Empirical Model Specification	149
6.3 Estimation Techniques	152
6.3.1 Stationarity Tests	153
6.3.2 Autoregressive Distributed Lag (ARDL) Bounds Testing Approach to Cointegration.....	156
6.3.3 Error Correction Model.....	159
6.4 Data Source and Definition of Variables.....	160
6.5 Conclusion.....	161
CHAPTER SEVEN	162
7. EMPIRICAL FINDINGS	162
7.1 Introduction.....	162

7.2 Empirical Findings for Uganda	162
7.2.1 Stationarity Tests for Uganda	162
7.2.2 ARDL Bounds Test for Cointegration for Uganda	165
7.2.3 Summary of the findings for Uganda	172
7.3 Empirical Findings for Kenya	173
7.3.1 Stationarity Results for Kenya	173
7.3.2 ARDL Bounds Test Results for Cointegration for Kenya	176
7.3.3 Summary of Findings for Kenya	182
7.4 Empirical Findings for Tanzania	183
7.4.1 Stationarity Results for Tanzania	183
7.4.2 ARDL Bounds Test Results for Cointegration for Tanzania	186
7.4.3 Summary of Findings for Tanzania	191
7.5 Conclusion.....	192
CHAPTER EIGHT	193
8. CONCLUSION AND POLICY RECOMMENDATIONS.....	193
8.1 Introduction.....	193
8.2 Summary of the Study	193
8.3 Summary of the Empirical Findings, Conclusions and Policy Implications	194
8.4 Limitations of the Study and Areas for Further Research	197
REFERENCES	198

LIST OF TABLES

Table 2.1: Selected Economic Indicators for Uganda (1960-1980)	10
Table 2.2: Selected Economic Indicators for Uganda (1986/87-1991/92)	14
Table 2.3: Monetary Policy Framework for Uganda.....	17
Table 2.4: Real GDP Growth Rates for Uganda (1991/92-2011/12).....	19
Table 2.5: Selected Financial Sector Indicators for Uganda (2012).....	25
Table 2.6: Commercial Banks's Profitability for Uganda (2009 to 2013).....	26
Table 2.7: FDI Flows to EAC (US\$ Billions).....	29
Table 2.8: Exposure to Foreign Currency Risks for Uganda.....	31
Table 3.1: Selected Economic Indicators for Kenya (1960-1970).....	42
Table 3.2: Selected Economic Indicators for Kenya (1971-1980).....	44
Table 3.3: Selected Economic Performance Indicators for Kenya (1980-1985)	48
Table 3.4: Monetary Policy Framework and Exchange Rate Regime in Kenya.....	56
Table 3.5: Kenya's Performance against the EAMU Convergence Criteria	57
Table 3.6: Real GDP for Kenya against Regional Selected Countries	59
Table 3.7: Interest Rate Structure for Kenya (1993-2012).....	61
Table 3.8: Selected Economic Structure Indicators for Kenya versus Select Comparators.....	63
Table 3.9: Financial Sector Indicators for selected SSA countries	64
Table 3.10: Banking Sector Financial Soundness for Kenya	65
Table 3.11: Financial Access for Kenya (2006 -2013)	67
Table 3.12: Kenya's Financial Access versus EAC Countries	68
Table 3.13: FDI Flows to EAC (US\$ Millions)	71
Table 3.14: Central Bank Independence Index Weighted (CBIW) for Kenya versus Other Regional Comparators.....	72
Table 3.15: World Governance Indicators for Kenya (2007-2012).....	76
Table 3.16: Kenya Public Debt (2011-2013).....	78
Table 4.1 : Selected Economic Indicators for Tanzania (1966-1985)	85
Table 4.2: Selected Sub-Saharan African Regional Real GDP Growth Rates (%)	95
Table 4.3: Selected Economic Structure Indicators for Tanzania	97
Table 4.4: Selected Financial Development Indicators for Tanzania (2012).....	99

Table 4.5: Chinn Ito Index for Tanzania versus EAC Countries (2008-2012)	101
Table 5.1: Empirical Literature Review on the Impact of Monetary Policy on Economic Growth	136
Table 6.1: Definition and Sources of Variables	161
Table 7.1: Augmented Dickey Fuller for Uganda	164
Table 7.2: Dickey- Fuller Generalised Least Squares (DF-GLS) for Uganda	164
Table 7.3: Phillips-Perron (PP) Unit Root Test for Uganda.....	165
Table 7.4 : ARDL Bounds Test Results for Uganda	166
Table 7.5 : Results of ARDL for Uganda.....	167
Table 7.6: ARDL-VECM model diagnostic tests for Uganda.....	170
Table 7.7: Augmented Dickey Fuller for Kenya	174
Table 7.8: Dickey- Fuller Generalised Least Squares (DF-GLS) for Kenya.....	175
Table 7.9: Phillips-Perron (PP) Unit Root Test for Kenya	176
Table 7.10: ARDL Bounds Test Results for Kenya	177
Table 7.11: Results of ARDL Model for Kenya	178
Table 7.12: ARDL-VECM Model Diagnostic Tests for Kenya	180
Table 7.13: Augmented Dickey Fuller for Tanzania	184
Table 7.14: Dickey-Fuller Generalised Least Square (DF-GLS) for Tanzania	185
Table 7.15: Phillips-Perron Test for Tanzania.....	186
Table 7.16: ARDL Bounds Test Results for Tanzania	187
Table 7.17: Results of ARDL Model for Tanzania.....	187
Table 7.18: ARDL-VECM Model Diagnostic Tests for Tanzania.....	189

LIST OF FIGURES

Figure 2.1: Selected Economic Indicators for Uganda (1991-2012)	18
Figure 2.2: Inflation and Real GDP Growth Rate for Uganda (1990-2013).....	20
Figure 2.3: Financial Development Indicators for Uganda (1991-2013)	21
Figure 2.4: Money Multiplier for Uganda (1991-2013)	22
Figure 2.5: Interest Rate Structure for Uganda (2011 to 2014).....	23
Figure 2.6: Interbank Rates for Uganda (2005 to 2013)	24
Figure 2.7: Chinn-Ito Financial Openness Index for Uganda versus EAC Countries (1997-2011)	28
Figure 2.8: Institutional Quality Indicators for Uganda (2002-2012)	33
Figure 2.9: World Commodity Prices (Index 2005=100)	34
Figure 2.10: Central Bank Credit to Government of Uganda (2001-2012).....	36
Figure 3.1: Selected Economic Indicators for Kenya (1986-1995).....	51
Figure 3.2: Selected Financial Depth Indicators for Kenya (1986-1995)	52
Figure 3.3: Selected Economic Indicators for Kenya (1996-2012).....	58
Figure 3.4: Selected Financial Depth Indicators (1996- 2012) for Kenya	59
Figure 3.5: Inflation Trend for Kenya (1996-2012).....	60
Figure 3.6: RTGS for Kenya (2005-2014).....	67
Figure 3.7: Money Multiplier for Kenya (1995-2013).....	69
Figure 3.8: Exchange Rate and Current Account for Kenya (1993 -2012).....	70
Figure 3.9: World Commodity Prices (Index, 2005=100) for period 2006-2014	77
Figure 3.10: Net credit to the Central Government for Kenya.....	79
Figure 4.1: Economic Indicators for Tanzania (1986-2010).....	93
Figure 4.2: Money Supply as share of GDP (1990-2010) for Tanzania	96
Figure 4.3: Exchange Rate and Current Account Deficit for Tanzania	100
Figure 4.4: World Commodity Prices (Index, 2005=100)	105
Figure 7.1: Graphical Expositions of the Time Series Variable Data for Uganda.....	163
Figure 7.2: Plot of CUSUM for Uganda	171
Figure 7.3: Cumulative sum of squares (CUSUMQ) plots for Uganda.....	171
Figure 7.4: Graphical Expositions of the Time Series Variable Data for Kenya	173
Figure 7.5: CUSUM for Kenya	181
Figure 7.6: CUSUMQ for Kenya	182

Figure 7.7: Graphical Expositions of the Time Series Variable Data for Tanzania	183
Figure 7.8: CUSUM for Tanzania	190
Figure 7.9: CUSUMQ for Tanzania.....	190

ACRONYMS

AIC	Akaike Information Criterion
ARDL	Auto Regressive Distributed Lag
ATM	Automated Teller Machine
BIC	Bayesian Information Criterion
CBK	Central Bank of Kenya
CBIU	Central Bank Independence Unweighted
CBIW	Central Bank Independence Weighted
BoT	Bank of Tanzania
BoU	Bank of Uganda
CPI	Consumer Price Index
CUSUM	Cumulative Sum of Recursive Residual
CUSUMQ	Cumulative Sum of Squares of Recursive Residual
DF-GLS	Dickey-Fuller Generalised Least Square
EACB	East African Currency Board
ECM	Error-Correction Model
ERP	Economic Recovery Programme
GDP	Gross Domestic Product
IFS	International Financial Statistics

IMF	International Monetary Fund
KIPPRA	Kenya Institute for Public Policy Research and Analysis
OLS	Ordinary Least Squares
RTGS	Real-Time Gross Settlement
SAP	Structural-Adjustment Programmes
SSA	Sub Saharan Africa
TFP	Total Factor Productivity
UNCTAD	United Nations Conference on Trade and Development
VECM	Vector Error-Correction Model

CHAPTER ONE

1. INTRODUCTION

1.1 Background to the Study

Economic growth is traditionally believed to be driven by a wide range of factors, but mainly by primary factors such as capital accumulation, growth in labour participation, advancement of knowledge and technological progress (Levine and Renelt, 1992; Barro and Sala-i-Martin, 1995; Mankiw and Taylor, 2007; Anyanwu, 2014). These primary factors are, however, believed to be affected by a host of other factors including the policy environment (Smith, 2004). According to Lucas (2003), output movements are largely attributed to real shocks linked to technological progress and cannot be effectively offset by monetary policy.

Conventional thinking, supported by empirical evidence, suggests that monetary policy has a limited role in driving economic growth, particularly in the long run (Arestis, 2007; Fontana and Palacio-Vera, 2007; Asongu, 2014). The literature on the explicit role of monetary policy instruments in stimulating economic growth, however, remains far from universal; and the results are varying, inconsistent and inconclusive (Dele, 2007; Amarasekara, 2009; White, 2013).

Long-term price stability remains the primary goal of monetary policy in most countries, with a hindsight objective of boosting growth, at least in the short run (Fontana and Palacio-Vera, 2007; Mester, 2015). Poor monetary policies associated with high and volatile inflationary tendencies distort the allocation of productive resources, eventually harming economic growth in the long run (Barro, 1997; Hossain, 2014). On the other hand, some empirical studies discount the negative relationship of inflation and economic growth (Levine and Renelt 1992; McCandless and Weber 1995). Monetary policy actions in driving steady and stable inflation tend to come with a depressing effect on economic growth, known as the sacrifice ratio (Mankiw, 2010; Dornbusch *et al.*, 2012).

Uncertainty on the effect of monetary policy on economic growth, particularly in developing economies, continues to prevail (Papademos, 2003; Berg *et al.*, 2013;

Asongu, 2014). Some studies suggest that monetary policy impetus to spur growth is likely to be inflationary – the latter having a countervailing effect (Issing, 2001). The recent surge of non-conventional monetary policy in the wake of the global financial crisis of 2008 suggests the limited role of conventional monetary policy.

The transmission mechanism from monetary policy to policy objectives (price stability and economic growth) has been found to be weak particularly in developing countries (Al-Mashat and Billmeier, 2007; Mishra *et al.*, 2012; Montiel *et al.*, 2012). In addition, some studies confirm a weakening relationship between money supply and policy objectives (White, 2013; International Monetary Fund, 2014a). In some instances, the appropriateness and relevance of monetary policy has been questioned, particularly for some developing countries with substantial informal sectors, poorly integrated financial sectors, low financial development and where the fiscal policy plays the dominant role in the economy (Weeks, 2010).

Conventional literature suggests that monetary policy actions are transmitted through various channels (Loayza and Schimdt-Hebbel, 2002). However, a number of empirical studies assert that the monetary policy affects the real economy through three main channels (Mishra *et al.*, 2012; Morales, 2012; Davodi *et al.*, 2013). First, there is the interest rate channel, where an increase in the nominal interest rate also increases the real interest rate, due to nominal rigidities, thereby discouraging expenditure. This in turn leads to reduced aggregate demand. Second, there is an exchange rate channel through which higher domestic nominal interest rates relative to those abroad cause the currency to appreciate, all else being equal. A stronger currency has a negative effect on demand and output, via both an expenditure switching effect (towards imports), and reduced competitiveness for industries that compete internationally. Finally, there is the expectations channel, where expectations concerning future inflation and economic growth play an important role in price- and wage-setting. If monetary policy is credible, economic growth is expected to be equal or close to the growth target (Loayza and Schimdt-Hebbel, 2002).

The effectiveness of monetary policy transmission, however, depends on *inter alia* the country's financial and economic structure, institutional and regulatory environment. Overall, the financial structure of the economy matters for monetary

policy transmission in the economy (Mishra *et al.*, 2012). The factors that matter relate to the country's financial sector development dynamics and include its size, composition and competition within the financial sector, the level of financial innovations, degree of financial integration with the international markets and the exchange rate regime (Montiel *et al.*, 2012). The institutional and regulatory environment, including the operational and institutional independence of the Central Bank, also matter (Huang and Wei, 2006).

Over time, there has been increased transition of monetary policy conduct from quantity targeting regimes to price targeting regimes, particularly for developed economies (Heintz and Ndikumana, 2010). There has been an increasing drift in a number of developing countries' monetary policy practices from targeting quantities *inter alia* money, credit, base money, bonds and foreign assets to prices, including exchange rate, interest rates and other asset prices (Heintz and Ndikumana, 2010; Khan, 2010). These changes re-inforce the unsettled debate of the impact of price-based monetary policy on economic growth.

Against this background, this study investigates the monetary policy and economic growth experiences in the three East African countries of Uganda, Kenya, and Tanzania. The East African Community (EAC), comprises two other countries: Rwanda and Burundi (Davoodi *et al.*, 2013). The EAC comprising Uganda, Kenya, and Tanzania was originally founded in 1967, but collapsed 10 years later and was only re-established in 2000. The limited research on monetary policy and economic growth among the three EAC countries, as well as the long-term historical time series data amongst the EAC, and historical economic ties between three countries motivated the choice of the three countries.

Price stability is considered the primary objective of monetary policy in the three EAC countries, while economic growth and financial stability are secondary objectives (Davoodi *et al.*, 2013). The respective monetary policy and exchange regimes remain relatively varied. Uganda and Kenya operate interest rate based monetary policy frameworks. Uganda adopted the inflation targeting lite regime in 2011, while Kenya operates a flexible and a hybrid monetary policy framework, where both the central bank rate and reserve money serve are used as operational targets. Tanzania operates exclusively a monetary targeting (Berg *et al.*, 2013). The respective central

banks use open market operations as the main monetary policy instrument. The secondary instruments are changes in reserve requirements, required reserve averaging and foreign exchange operations, although there are country-specific differences in the application of these instruments (Morales, 2012; Davoodi *et al.*, 2013). The exchange regime in the three EAC countries is largely classified as flexible exchange rate policies, with varying levels of central bank intervention in foreign exchange markets.

Despite these countries enjoying steadfast growth rates over the 1990s and the 2000s, they continue to be characterised by low levels of financial and economic development, consistent with low income countries' structure in sub-Saharan Africa (Berg *et al.*, 2013). The three countries are largely agriculture based and rely largely on primary commodity exports as the main source of their foreign exchange revenue.

1.2 Statement of the Problem

The evolution of monetary policy theory has left sizeable controversies and intricacies related but not limited to the impact, time path and speed of transmission (Galbraith, 2008; Leijonhufvud, 2009). This is also traced in empirical research over the years (Galbraith, 2008; Arestis, 2009; Leijonhufvud, 2009). The dominance of output gaps in the last decade in most economies, particularly developed economies, has heightened the debate on the role of monetary policy in addressing demand deficiencies and economic growth (Woodford, 2007; White 2013).

Evidence continues to evolve, suggesting weak and unreliable monetary policy transmission in developing countries – implying that the nexus between monetary policy actions and economic growth remains poorly understood (Mishra *et al.*, 2012). Relevant empirical studies have largely focused on developed economies and the few that examined developing economies have centered on the impact of money supply on economic growth (Mishra *et al.*, 2012; Davoodi *et al.*, 2013 and Asongu 2014). Despite the dominance of contemporary theories favouring an interest rate policy framework, both practice and empirical research, especially in developing countries, have placed emphasis largely on the impact of money supply and economic growth as well as long-run neutrality (Mishkin, 2004; Asongu, 2014). Long-

run monetary neutrality is also found in the growing academic literature (Bernanke and Mihov, 1998; Bullard, 1999; Nogueira 2009; Asongu, 2014).

The recent surge of non-conventional monetary policy in the wake of the global financial crisis of 2008, espouses the intricacies related to the nexus between monetary policy and economic growth. The slowing economic growth trend over the last decade can also be traced among the East African countries. Overall, the evidence of the impact of monetary policy on economic growth on the East African countries remains very limited (Davoodi *et al.*, 2013; Berg *et al.*, 2013).

The academic literature that exists on the monetary policy and economic growth relationship remains ambiguous, seemingly dependent on country characteristics, the choice of monetary policy variables used and methodology (Walsh 2003; Berg *et al.*, 2013). This also applies to the scholarly works on the nexus between monetary policy and economic growth in the EAC countries (Berg *et al.*, 2013). Most studies on this subject have relied on Vector Auto Regressive (VAR) methodology, where results depend on the restrictions imposed, and this may have limitations, particularly for developing economies (Ivrendi and Guloglu, 2010; Grace Li *et al.*, 2013).

This study makes a twofold contribution: i) employing the superior autoregressive distributed lag (ARDL) bounds testing approach by Pesaran *et al.* (2001) in an attempt to establish the effect of monetary policy on economic growth in the three EAC countries. To my knowledge, this study may be the first of its kind to use the ARDL modelling to examine in detail the monetary policy and economic growth nexus in East Africa ii) adopting two monetary policy variables of money supply and interest rate since monetary policy is concerned with changes in the supply of money and short-term interest rate in a bid to attain the set out objectives.

The three research questions that this study attempts to answer are: 1) Does an increase in money supply have a positive impact on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run? 2) Does an increase in Interest rate have a negative impact on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run? 3) Does money supply have a relatively more pronounced impact on economic growth than interest rate in Uganda, Kenya and Tanzania both in the short run and in the long run?

1.3 Objectives of the Study

The general objective of the study is to estimate the impact of monetary policy on economic growth in the three EAC countries (Uganda, Kenya and Tanzania).

The specific objectives of this study are to:

- i. empirically examine the impact of money supply on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run.
- ii. empirically examine the impact of interest rate on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run.
- iii. empirically examine the relative impact of money supply and interest rate on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run.

1.4 Hypotheses of the Study

The following hypotheses are tested:

- i. Money supply has a positive impact on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run.
- ii. Interest rate has a negative impact on economic growth in Uganda, Kenya and Tanzania both in the short run and in the long run.
- iii. Money supply has a relatively more pronounced impact on economic growth than interest rate in Uganda, Kenya and Tanzania both in the short run and in the long run.

1.5 Significance of the Study

This study adds to the limited and inconclusive literature on the nexus between monetary policy and economic growth through an empirical investigation of the respective linkage in the selected EAC countries. In the empirical analysis, monetary policy is represented by monetary policy variables of money supply and interest rate. The study examines the impact of monetary policy on economic growth in the short run which has largely been ignored in academic literature (Arestis, 2009; Asongu, 2014). The study also includes inflation as one of the control variables in the growth

equation in order to capture the indirect impact of monetary policy on economic growth by maintaining price stability.

Uganda, Kenya and Tanzania have already ratified the EAC Monetary Union protocol. The respective fully fledged transition requires understanding the impact of the radical changes to monetary policy as well as to exchange rate policy. The EAC monetary policy frameworks will have to be refocused primarily on the exchange rate objectives and each central bank will have to pay close attention to the monetary policies of its partners in the East African Community (Tumusiime-Mutebile, 2010). This study aims to provide frontier of knowledge in understanding the impact of monetary policy changes on economic growth in Uganda, Kenya and Tanzania. The exchange rate proxy is also included to capture the external competitiveness impact. In addition, this study considers other control variables to improve the robustness of the empirical results and produce unbiased estimates.

The study, as afore mentioned, examines the impact of monetary policy on economic growth in Uganda, Kenya and Tanzania using the autoregressive distributed lag (ARDL) bounds testing approach. This method has profound advantages over the traditional cointegration methods, especially when small samples are used, such as in this study. Additionally, to the extent of the empirical studies reviewed, no study has used this modern empirical methodology to examine the monetary policy and economic growth nexus in East Africa.

1.6 Organisation of the Study

The rest of the study is organised as follows: Chapter 2 explores the monetary policy and economic growth dynamics in Uganda while Chapter 3 gives an exploratory overview of monetary policy reform and economic performance in Kenya. Chapter 4 gives an overview of monetary policy reform and economic performance in Tanzania. Theoretical and empirical literature on monetary policy and economic growth are reviewed in Chapter 5. Chapter 6 discusses the estimation techniques used in this study and the choice of variables used, while Chapter 7 covers the empirical modelling and the discussion of results. Finally, Chapter 8 concludes the study.

CHAPTER TWO

2. MONETARY POLICY AND ECONOMIC PERFORMANCE IN UGANDA

2.1 Introduction

This chapter discusses Uganda's post political independence from the British in 1962 and the associated policy changes. The chapter also explores the economic and monetary performance over the years; and it highlights the challenges facing the performance of monetary policy. In particular, the study assesses the main features of Uganda's monetary regime, and the associated economic performance from 1962 to 2014.

This chapter also explores the prevailing factors that could affect the monetary policy transmission into its ultimate objective of enhancing economic growth. Monetary transmission mechanisms have been found to be relatively weak in low income countries (LICs) compared to the high income countries (HICs), explained by a number of factors (Mishra *et al.*, 2010; 2012).

This chapter is further divided into six (6) sections. Section 2.2 outlines the main features of Uganda's monetary policy regime and the associated economic performance between 1962 and 1986. Section 2.3 explores the monetary environment in Uganda from 1987 to 2014. The financial structure as well as the Uganda's exchange rate regime and capital account is presented in Section 2.4. Section 2.5 highlights the challenges to the effective performance of monetary policy in Uganda. Finally, Section 2.6 concludes the chapter.

2.2 Monetary Policy Regime and Economic Performance in Uganda (1962-1986)

Uganda, a small open economy, attained its political independence in 1962. Since then, it has been characterised by several macro-economic policy shifts. The conduct of monetary policy was vested in the East African Currency Board shared with Kenya and Tanzania. During the period between 1962 and 1966, the monetary policy had a limited function in the management of the macro-economy, because the country operated under the East African Currency Board (EACB). In 1966, the main roles and functions of the EACB became vested upon the Central Bank, namely the Bank of Uganda (BoU), formed under the 1966 Bank of Uganda Act (Musinguzi and Katarikawe, 2000). It became operational in August 1966, mandated to issue and manage the Uganda shilling (Musinguzi and Katarikawe, 2000).

Post-independence, Uganda was characterised by political and social crises – until the early 1990s. The political instability of the 1960s included the suspension of the Constitution, and the prime minister then assuming the supreme power of government. The political environment negatively impacted macro-economic stability (Kuteesa *et al.*, 2006). The State held a dominant stake in the financial sector; and as a whole, the system was tightly regulated and taxed through administered interest rates and directed credit, in addition to high legal reserve requirements. Real GDP grew at an average rate of 4.8% in the 1960s. This growth was supported by the national savings rate at an average of 13.4% of GDP and national domestic investment at an average 13% of GDP (Kuteesa *et al.*, 2006). The manufacturing sector was also a critical growth driver, and industrial output accounted for 14% of GDP in 1971 (Kuteesa *et al.*, 2006). Table 2.1 shows selected economic indicators for Uganda during the period from 1960 to 1980.

Table 2.1: Selected Economic Indicators for Uganda (1960-1980)

Year	Real GDP Growth Rate (%)	Inflation(GDP Deflator)	M1 (% Growth)	Credit to Government (% Growth)	Domestic Credit (% Growth)
1960	3.2	1	-	-	-
1961	-1.1	2	-	-	-
1962	4.1	-6	-	-	-
1963	11.7	7	-	-	-
1964	7.5	9	-	-	-
1965	0.9	17	-	-	-
1966	6.3	-11	-	-	-
1967	5.1	5	8	-	-
1968	3.2	15	21	35	22
1969	11.7	3	10	77	13
1970	0.7	2	14	77	23
1971	-0.2	4	2	64	26
1972	1	8	36	55	35
1973	-1	24	38	49	37
1974	-2	57	43	35	34
1975	-2	20	8	24	18
1976	1	46	37	33	27
1977	-1.6	89	30	15	25
1978	-5.5	36	21	30	24
1979	-11	216	52	28	23
1980	-3.4	150	31	59	64

Source: Authors computations based on data from International Financial Statistics (2014); World Bank (2014).

Table 2.1 shows that annual inflation – despite going into double digits between 1965 and 1968 – it averaged 4% per annum in the 1960s. The double-digit inflation in the mid to late 1960s was associated with an exponential growth in credit as shown in Table 2.1.

In 1971, a new government came into power through a military coup, and this was followed by a sequence of political, social and economic mismanagement. Coupled with the external shocks, the economy encountered major economic imbalances (Kuteesa *et al.*, 2006). The economic situation of the 1970s worsened, mainly due to the poor domestic policies, including the restriction of government sharing in

companies to 49%, the demise of the EAC, expulsion of the Asians in 1972 and the associated economic sanctions against Uganda (Musinguzi and Katarikawe, 2000). Negative real GDP growth rates were recorded from 1973 through to 1980, also as shown in Table 2.1.

Fiscal deficits continued to rise as a result of increased military expenditure and they were funded largely by printing money. As a result, monetary policy continued to be subordinate to the fiscal pressures. The weak legal system, coupled with increased government borrowing led to the crowding out of the private sector. The government borrowing accounted for about 70% of domestic credit (Musinguzi and Katarikawe, 2000). The state continued to carry out direct controls on credit, interest rates, agricultural commodity prices and exchange rates. The control of the latter led to the shilling being overvalued, which arguably had an impact on export volumes declining (Musinguzi and Katarikawe, 2000).

The financial system was weakened, with limited competition for loans and deposits, mainly short-term. There were no securities, equities, and money and inter-bank markets. The government controlled the banking system in terms their spread and operations, with government stepping in, to meet the credit requirements of some firms (Brownbridge, 1996a). Banking deposits were unattractive as a result of financial repression, and consequently the number of commercial bank branches reduced by 71% in ten years to 84 banks in 1980 (Brownbridge, 1996a). Banking services became increasingly concentrated to a few banks and the largest commercial bank – the Uganda Commercial Bank at the time – was government-owned (Mugume, 2006).

Negative real interest rates were encountered, largely due to the double to triple digit inflation and this eventually led to a sizeable decline in financial depth (Brownbridge, 1996a). M2/GDP ratio declined by 50 percentage points to 9.5% between 1970 and 1985 while the bank deposits to M2 ratio were reduced by 8% to 57% over the corresponding period (Brownbridge, 1996a).

The 1980s, however, became the period of major economic reforms in Uganda under the auspices of the International Monetary Fund (IMF)/World Bank. With respect to the financial sector, government set a specified limit on net bank credit to

government, monetary growth, public spending, and the overall fiscal stance (Barungi, 1997). In June 1981, Uganda adopted its first structural adjustment programme, with the support of the IMF and the World Bank. This policy package included price liberalisation, devaluation, trade-policy reforms, public enterprise, and fiscal reform, including reduced subsidies and the rationalization of public spending (Barungi, 1997). Consequently, the aggregate output recorded a growth – during the period 1981-1983 – averaging 5.5% per annum (Maehle *et al.*, 2013).

The IMF standby arrangements went off-track during the Economic Recovery Programme (ERP) in 1984 mainly due to fiscal slippages. In an effort to restore macroeconomic stability, a managed float-exchange rate and a dual exchange rate were merged in 1984, before reverting to a fixed exchange rate regime in 1986 (Atingi-Ego and Sebudde, 2000).

Between 1970 and 1986, the economy encountered a significant economic decline, manifested in slow or negative growth rates, negative real interest rates, and declining financial growth (Musinguzi and Katarikawe, 2000). During this period, real GDP per capita declined by 38%, M2 as share of GDP fell by 50% and inflation rose to 200% in 1986 (Brownbridge, 1996a). The economic retardation was attributed to domestic and external shocks. In particular, the main domestic shocks were mainly poor economic policies and the political instability over the years.

There was an increased level of fiscal dominance¹, rendering monetary policy inept. On average, credit to the government accounted for more than 50% of the total credit. Monetary policy conduct was through direct controls on credit and interest rates and the reserve requirements were kept at the same level despite the prevailing circumstances. Despite the changing liquidity conditions, reserve requirements remained unchanged at 10% of commercial banks' deposit liabilities between 1972, to 1986. Interest rates were administratively set and remained unchanged for long periods, despite inflation developments (Musinguzi and Katarikawe, 2000). Inflation

¹ Fiscal dominance may be defined as a situation which the government adopts a fiscal stance that is incompatible with sustaining low inflation without recourse to distortionary fiscal measures (Adam, 2009).

rose to double digits and triple over this period leading to real negative interest rates – consequently leading to excessive bank credit (Musinguzi and Katarikawe, 2000).

The IMF's structural adjustment programme adopted in 1981 and reinforced in 1984 was not successful in reversing the economic imbalances. In fact, GDP growth averaged -0.4% between 1983/84 and 1985/86 (Kuteesa *et al.*, 2006).

2.3 Monetary Policy Reforms and Economic Performance in Uganda (1986-2014)

In 1986, the IMF resumed the Structural-Adjustment Programme (SAP), which was aimed mainly at reducing inflation and restoring the sustainable balance of payments. In the financial sector, the SAP was aimed at increasing the competition in the financial sector, and at increasing the range of financial instruments through an expanded financial infrastructure. It also targeted the deregulation of interest rates, improving the overall process of financial intermediation, mobilization, and the allocation of resources (Atingi-Ego and Sebudde, 2000). Other targets of the economic SAP included: The removal of price controls and import licensing, as well as the progressive decontrol of foreign-exchange management (Atingi-Ego and Sebudde, 2000).

The interest rate policy reforms in Uganda commenced in 1986, with an aim of mitigating the negative real interest rates. Over the three years that followed, the interest rates were announced on budget day and remained unchanged during the financial year except for a few interventions. In 1989, the Interest rate regulations changed to ensure zero real interest rates where nominal interest rates were adjusted to match inflation (Bategeka and Okumu, 2010).

The first official exchange rate changes were effected in 1987, with the shilling subjected to gradual devaluations. Eventually, it resulted in a real effective depreciation of nearly 75% and in a reduction in a differential between official rate and the more depreciated exchange rate for the shilling in the “parallel” market (Maehle *et al.*, 2013). A crawling peg was adopted in July 1989, where the exchange rate was adjusted by the inflation differential between Uganda and her trading

partners of Kenya, United Kingdom (UK) and United States (US) on a monthly basis (Maehle *et al.*, 2013).

However, most of the structural adjustment financial-liberalisation policies initiated in the early 1980s aimed at restoring the macro stability were not fully implemented until the 1990s (Kasekende and Atingi-Ego, 1996). Table 2.2 shows the selected macro-economic indicators for the period from 1986 to 1992.

Table 2.2: Selected Economic Indicators for Uganda (1986/87-1991/92)

Economic Indicator	Average (1986/87-1991/92)
Average end-period inflation (% per year)	107.6
Growth in average money supply M2 (% per year)	105.5
Domestic financing of the budget (% of GDP)	1.2
GDP growth rate (% per year)	5.7
Money supply M2 (% of GDP)	6.3

Source: Authors computation based on data from Uganda Bureau of Statistics (2014) and Bank of Uganda (2014).

As shown in Table 2.2, macro-economic stability was, therefore, not attained until 1992 – five years after the adjustment process was agreed upon by the IMF and the World Bank. Inflation and the growth in the annual money supply remained above 100%; and the average domestic financing over these five years was only 1.2% of GDP.

In 1990, the liberalisation of the exchange rate commenced with the legalisation of the Foreign Exchange bureaus and the adoption of the foreign exchange auctions. In 1991, the Treasury bill market changed to a system through which interest rates were

market-determined (Mikkelsen and Peiris, 2005). Controls on government expenditure were instituted in 1992, creating monetary space to control inflation and rebuild the foreign exchange reserves (Mikkelsen and Peiris, 2005).

However, two major economic shocks were encountered in the 1991/92 period – heightened food inflation resulting from the drought; and the shortfall in revenue and programmed aid flows. The latter culminated into a widening fiscal deficit financed by an increase in central bank credit to government, equivalent to 40% of the money stock (Kuteesa *et al.*, 2010). However, in the last quarter of 1991/92, expenditure was reduced by 1.8% of GDP – reducing the domestic credit to government and money supply. Inflation thereafter stabilised within three months (Kuteesa *et al.*, 2010).

Prior to 1993, Uganda maintained strict restrictions on both current and capital account. The interest rates were fully liberalised in July 1994, while the capital account of its balance of payments was liberalised in July of 1997. Since then, there have been no restrictions on capital movements – in or out of Uganda (Musinguzi and Katarikawe, 2000). The Capital Markets Authority and the Uganda Securities were established in 1996 and 1997 respectively. These, combined with no-restrictions in capital markets, opened doors for the external players to invest in the Uganda securities (Kasekende, 2001).

Under the Bank of Uganda Statute of 1993, the Bank of Uganda was mandated with the exclusive responsibility for monetary policy formulation and consequently, the Reserve Money Programme (RMP) was adopted, abandoning the post-Independence monetary framework of direct controls (Opolot, 2007). Under the RMP, the growth of base money is then projected to be in line with the broader monetary aggregates but also consistent with the macroeconomic objectives (real GDP growth rate, inflation, and import cover) with assumptions for velocity. Price stability was considered the primary objective of BoU (Berg *et al.*, 2013; Opolot *et al.*, 2013). Therefore, reserve money became the operating target and was set premised on the macro-economic targets of inflation, economic growth and balance of payments (Opolot *et al.*, 2013). The Financial Institutions Statute of 1993 also mandated BoU to supervise and regulate the financial institutions.

A change in the reserve requirements of commercial banks, and the issuing of treasury bills were the available monetary policy instruments in the 1990s. In addition, BoU retained the control of the rediscount rate, when the interest rates were liberalised. The uncompetitive segment of the commercial banking sector with excess liquidity implied that changes in the rediscount rate had only a limited impact (Kuteesa *et al.*, 2010). In the mid-1990s, the Central Bank was unwilling to change the reserve requirements, because several of the small banks were too fragile to comply – without becoming bankrupt. This neutered the reserve requirement instrument (Kuteesa *et al.*, 2010).

Following the freeze of domestic borrowing in 1992, the main aim of the sales was to develop the capital markets – especially the secondary market. However, in the 1990s, there remained virtually no secondary trading of the Treasury bills – limiting the role of Treasury bills as a monetary instrument. The Treasury bond only became an instrument of monetary policy in 2004 (Kuteesa *et al.*, 2010).

Despite the economic reforms for almost a decade, the weakness of the financial sector in Uganda remained evident in the numerous bank failures in the mid-1990s. Following the two-year moratorium instituted against licensing any new banks, the number of banks that had increased from 9 in 1991 to 20 in 1996 reduced to 15 when a number of commercial banks became insolvent between 1997 and 2000, while government continued to divest its shares in the commercial banks (Cihak and Podpiera, 2005; Mugume, 2006).

The BoU, however, responded by firming up its oversight role on the commercial banks through stringent and prudent enforcement of the Financial Institutions Act, 1993 (Opolot, *et al.*, 2013). The new Financial Institutions Act, as amended in 2002, aimed at reinforcing the strengthening supervision and regulatory roles of the central bank; and subsequently the Micro Finance Deposit-taking Institutions Act of 2003 was set up, resulting in the licensing of four micro finance institutions to take deposits (Opolot, *et al.*, 2013). In addition, the Central Bank established the Financial Stability Department in July 2009 – to analyse and monitor systemic risks to the financial system (Opolot *et al.*, 2013).

In 2009, the RMP was modified, and a flexible version of the RMP was adopted, with Net Domestic Assets (NDA) as the operating target; and in July 2011, the RMP base-money targeting was replaced by “*Inflation Targeting Lite (IFL)*”. The most important consequence of the change in monetary policy regime is that the operating instrument for monetary policy became an interest rate (the central bank rate, or CBR), rather than the monetary base (Berg *et al.*, 2013).

Under the new regime, interest rate was the operating target of monetary policy (the CBR), which is set monthly and used to guide 7-day interbank interest rates. A corridor around the CBR is also defined – to signal the allowed deviations of the interbank rate from the policy rate. Furthermore, its width is frequently adjusted. The rediscount policy is also often used by the BOU to signal policy (Opolot *et al.*, 2013).

The monetary policy objectives, even with the adoption of inflation-targeting lite, continue to achieve low and stable inflation, boosting economic growth through enhanced private sector credit and improving balance of payments. Table 2.3 shows the monetary policy framework in Uganda.

Table 2.3: Monetary Policy Framework for Uganda

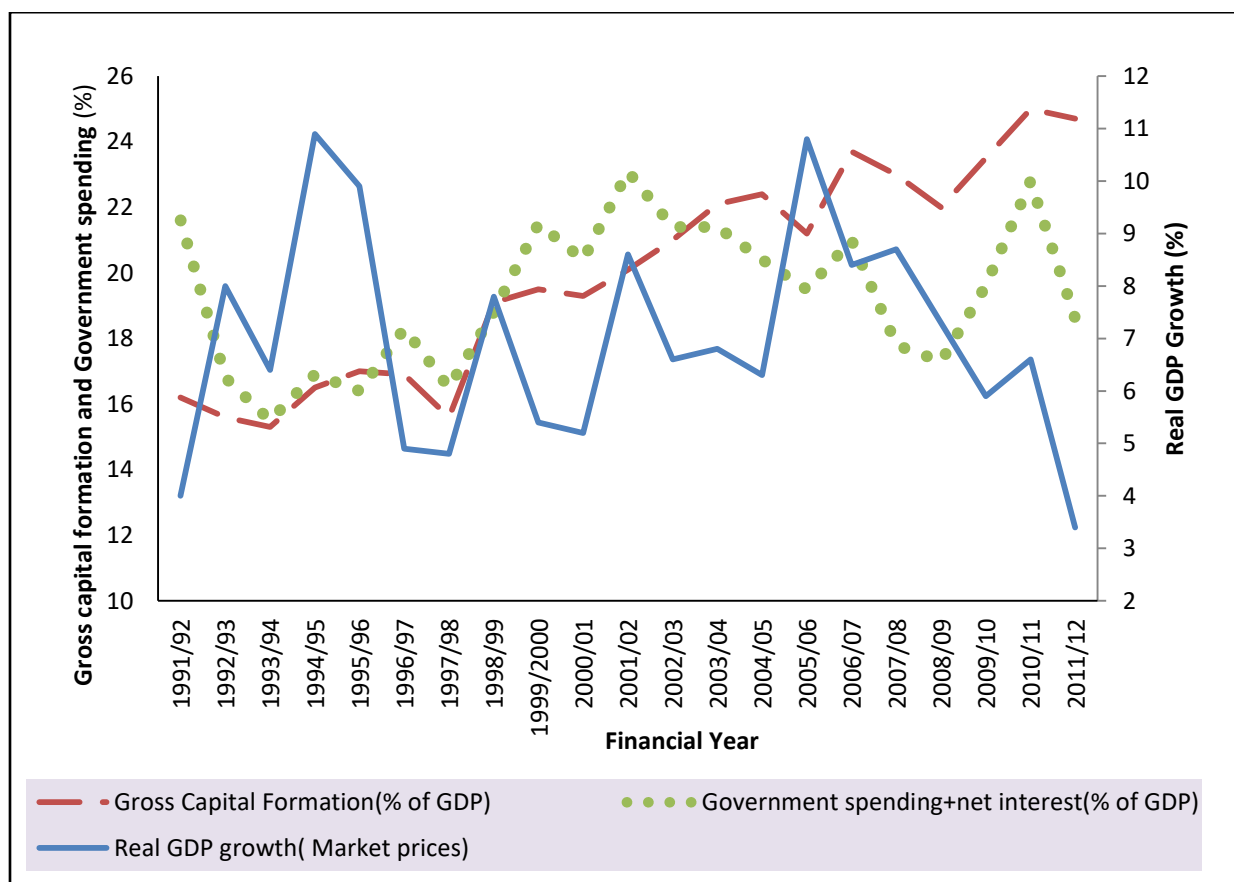
Monetary Policy Framework	Monetary Policy Mandate	Monetary Policy Instruments
Inflation-targeting Lite	Price stability, economic growth, and financial stability	Policy rate, foreign-exchange intervention, rediscount policy and open-market operations

Source: Authors computation based on data from BoU (2013b); IMF (2014a)

Price stability continues to be the primary objective and would take precedence over the any other objective in case of conflict (Davoodi *et al.*, 2013). These objectives highlighted in Table 2.3 are reported on through monthly monetary policy statements, which are likely to strongly guide the private expectations of these key variables (Opolot *et al.*, 2013).

In November 2013, Uganda signed the East African Monetary Union Protocol. All the partner states have concluded its ratification. The adoption of a common currency is expected in 2024, with member states surrendering their currency and monetary policy sovereignty (Drummond *et al.*, 2015). Figure 2.1 shows selected economic indicators for Uganda from 1991 to 2012.

Figure 2.1: Selected Economic Indicators for Uganda (1991-2012)



Source: Authors computation based on data from Uganda Bureau of Statistics [UBoS], (2014)

Uganda has experienced growth acceleration over the last two decades, enjoying an average annual real growth rate of 7% from 1991 to 2011, as illustrated in Figure 2.1. Notably, Figure 2.1 illustrates that increased investments were needed for economic growth over the years; and also government continued to be a major contributor to economic growth. Gross capital formation increased from 16% of GDP in 1991/92 to about 25% in the financial year (FY) 2011/12. However, government spending declined marginally by 2% of GDP from 21.6% to about 18.6% over the

corresponding period, as shown in Figure 2.1. Table 2.4 shows that the growth rates for Uganda from 1991 to 2012.

Table 2.4: Real GDP Growth Rates for Uganda (1991/92-2011/12)

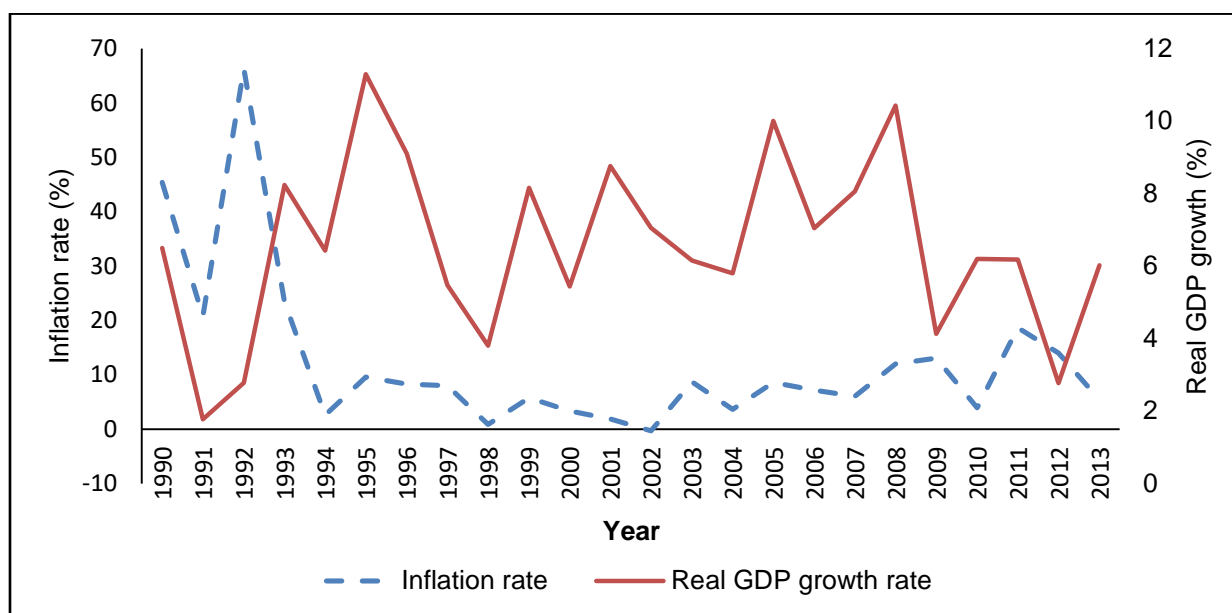
Average Real GDP Growth (%, FY 1991/92- 2011/12)*	Average Real GDP Growth (%, 2008/09-2011/12)*	Average Real GDP Growth (%,2001-2011)**	Average Real GDP Growth (%,2011-2013)**
7.0	5.8	7.3	5

Source: Authors computation based on data from *Uganda Bureau of Statistics (2014); ** IMF (2014a)

Table 2.4 shows that the growth rates however have been varied over two decades leading to 2013.

Figure 2.2 shows the Inflation and real GDP growth rate trend for Uganda from 1990 to 2013.

Figure 2.2: Inflation and Real GDP Growth Rate for Uganda (1990-2013)

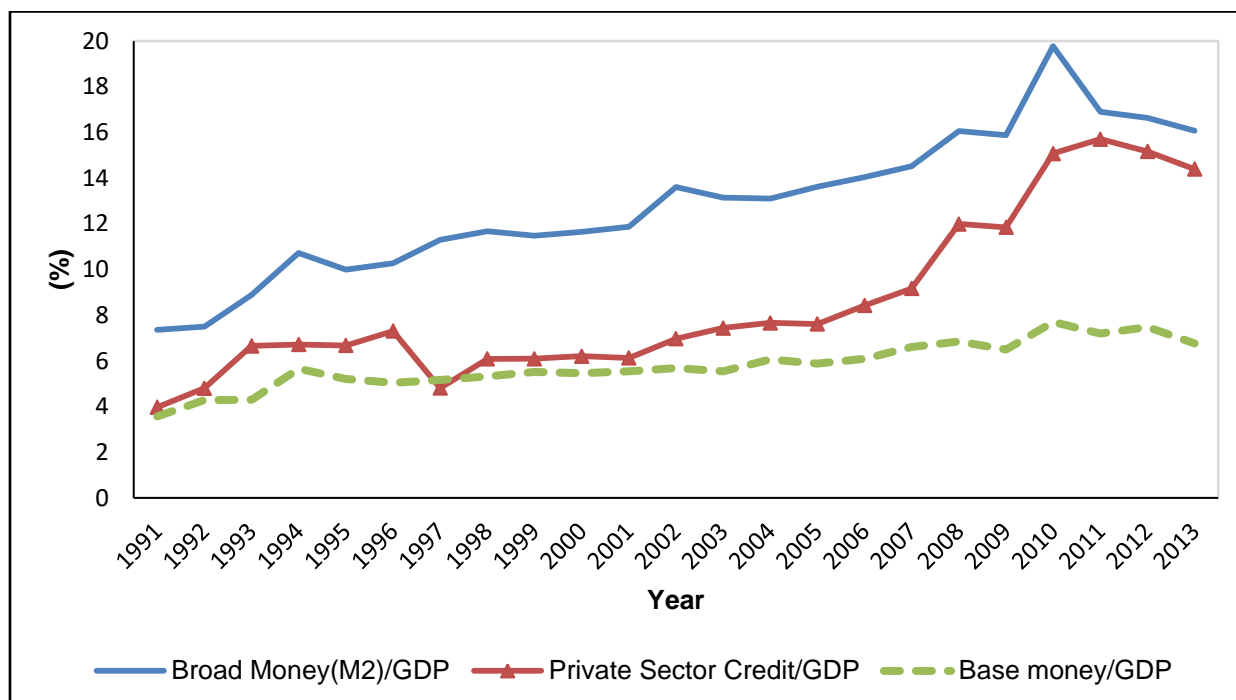


Source: Authors computation based on data from BoU (2014).

Figure 2.2 illustrates a scissor relationship between inflation and economic growth, suggesting that inflation constrains growth. Monetary policy tailored towards price stability would lay a conducive environment for boosting growth (Papademos, 2003). As shown in Figure 2.2, inflation was relatively stable and in single digits for most of the 1990s and 2000s. Headline inflation average 4.6% annually between 1994 and 2000 and 6.5% between 2001 and 2010.

Figure 2.3 presents the selected financial development indicators for Uganda over the period from 1991 to 2013.

Figure 2.3: Financial Development Indicators for Uganda (1991-2013)



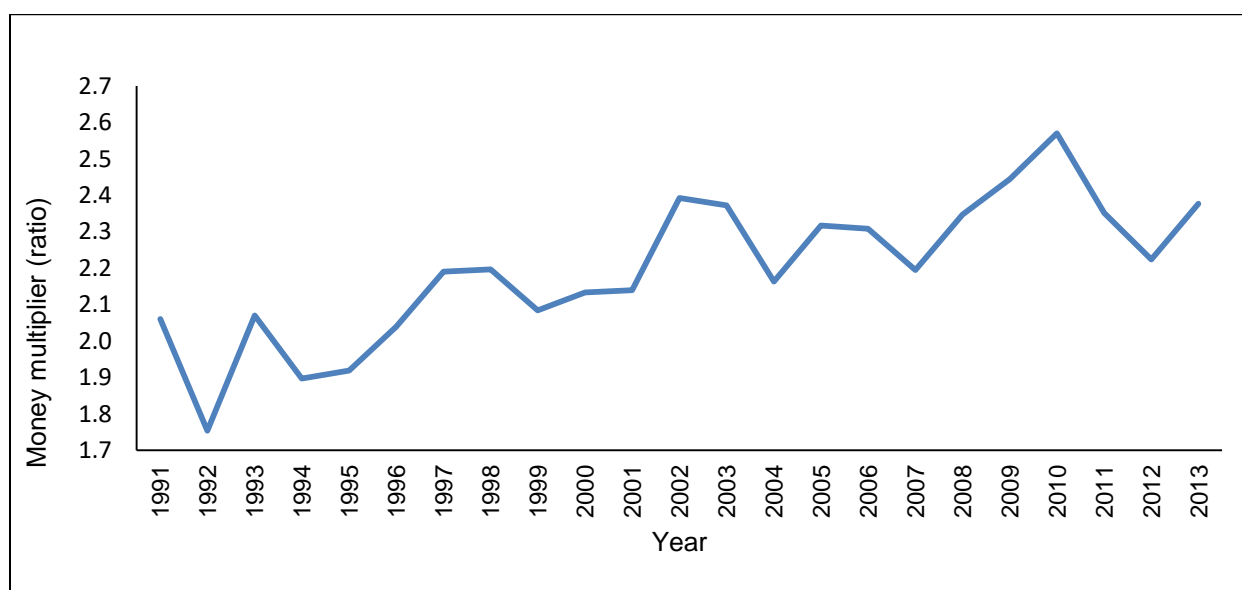
Source: Authors computation based on data from BoU (2014); UBoS (2014).

The high growth patterns reported in Figure 2.2 show a positive co-movement with increased monetarisation and financial deepening reported in Figure 2.3 over the period 1991- 2013.

Figure 2.3 shows that over the corresponding period, there was significant growth in credit to private sector and in broad money, which indicates a degree of financial deepening. Private sector credit as a share of GDP grew from 4% in 1992 to about 15% in 2013, while broad money as a share of GDP has grown from 7.3% in 1992 to 16% in 2013 (Abuka and Egesa, 2007). Despite the rapid growth in private sector credit associated with high economic growth, empirical research shows that increased credit to government, poor infrastructure quality, high lending interest rates are detrimental to credit growth (Abuka and Egesa, 2007).

The estimated multiplier and the velocity have over the years been unstable in the short run (Davoodi *et al.*, 2013). Figure 2.4 shows the money multiplier for Uganda over the 1991 to 2013 period.

Figure 2.4: Money Multiplier for Uganda (1991-2013)

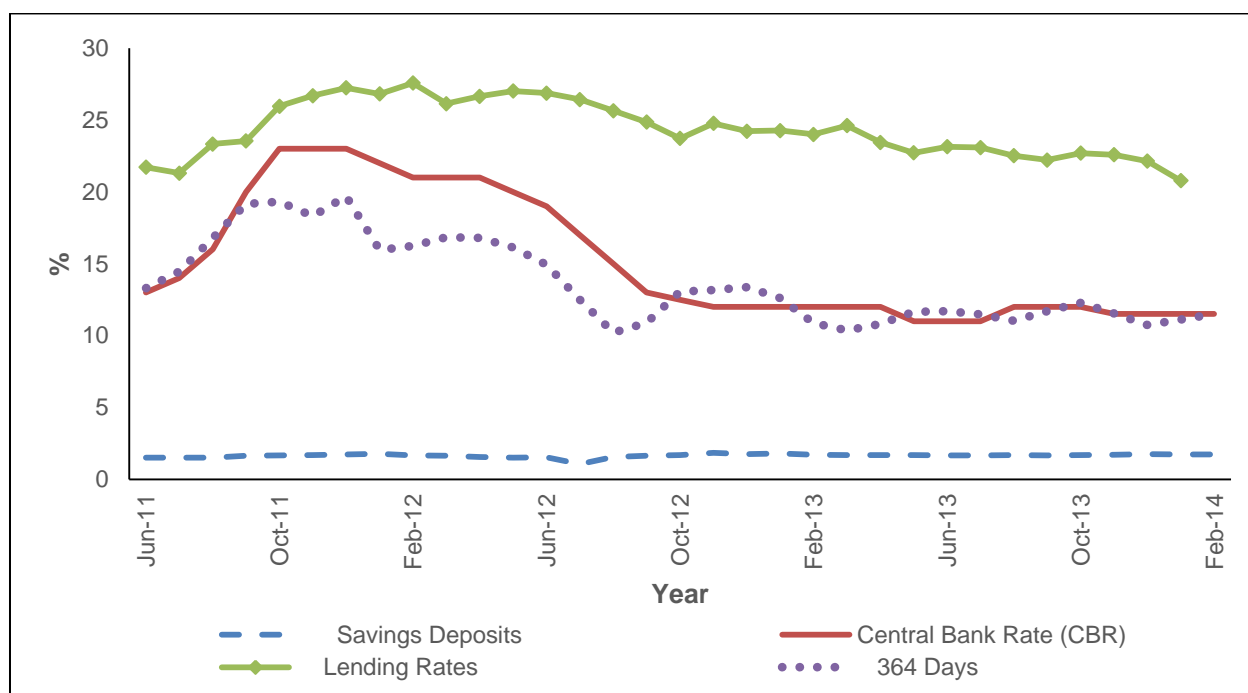


Source: Authors computation based on data from BoU (2014)

The increase in money multiplier as shown in Figure 2.4, from less than 2% in 1992 to about 2.4% in 2003, implies that broad money (M2) as share of GDP grew faster than base money as share of GDP. The increase in money multiplier is also consistent with increase in monetisation and financial deepening shown in Figure 2.3. Not only has the multiplier increased but also the estimated multiplier and velocity has been unstable in the short run (Davoodi *et al.*, 2013).

Figure 2.5 presents the interest rate structure for Uganda from 2011 to 2014.

Figure 2.5: Interest Rate Structure for Uganda (2011 to 2014)



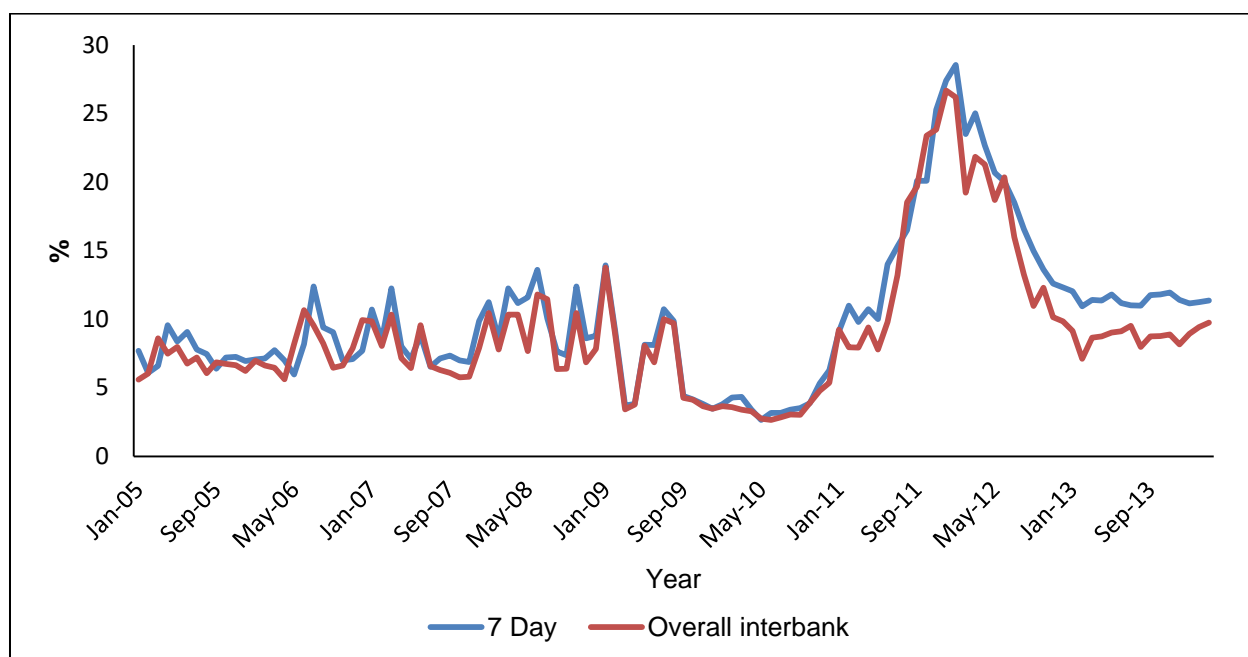
Source: Authors computation based on data from BoU (2014).

Figure 2.5 also shows that interest rate spread (the difference between the lending rate and the saving deposits rate) has remained high. The annual lending rates averaged 24.3% between July 2011 (when the CBR was introduced) and February 2014 compared to the annual savings deposit rate of 2.9% over the same period. The high interest rate structure in Uganda is in part explained by the oligopolistic nature of the banking sector, the size and competition of the formal financial sector, coupled with the restrictive monetary policy choices (Adam, 2009). High interest spreads are usually associated with limited depth and breadth of the financial systems. Countries with low levels of financial deepening inform of lower levels of credit to the private sector as share of GDP and deposits in the financial system as share of GDP have higher interest rate spread (Honohan and Beck, 2007).

In addition, monetary shocks to money demand tend to lead to volatility of interbank rates when the monetary policy framework relies on strict observance of the announced monetary targets (Berg *et al.*, 2013).

Figure 2.6 presents the interbank rates for Uganda for period 2005 to 2013.

Figure 2.6: Interbank Rates for Uganda (2005 to 2013)



Source: Authors computation based on data from BoU (2014).

Figure 2.6 shows that prior to moving away from strict monetary targeting in October 2009, the interbank rate was volatile. This was in tandem with findings of Berg *et al.* (2013). The volatility has least reduced after a switch to inflation targeting lite in June 2011. The spike observed in 2011 and 2012 is consistent with the hike in central bank rate as demonstrated in Figure 2.5.

2.4 Financial and Economic Structure of Uganda

Uganda's financial system is characterised by small and concentrated private bank-dominated financial systems, a large informal financial sector, shallow capital markets, short-yield curves, and heightened dollarisation (Berg *et al.*, 2013; Montiel, 2013). Dollarisation is also measured by the share of foreign currency deposits to total deposits in the banking system. Foreign currency deposits – as a share of total deposits in the banking system – account for 33.8% (BoU, 2013a). This is higher than the IMF 2011 estimates of LICs, and the HICs share of 12.8% and 0.4%, respectively (Berg *et al.*, 2013).

Uganda's financial system consists of the BoU, 26 commercial banks, eight (8) credit institutions, and four (4) micro-finance deposit-taking institutions, the National Social Security Fund (NSSF), a postal bank, 25 insurance companies, two (2) development banks, 102 foreign-exchange bureaux, and the Uganda Securities Exchange. As at December 2012, the commercial banks owned about 99.98% of the total assets of the deposit-taking institutions in the financial system (Opolot *et al.*, 2013).

Table 2.5 shows selected financial sector indicators for Uganda in 2012.

Table 2.5: Selected Financial Sector Indicators for Uganda (2012)

	Adults with an Account at a Formal Financial Institution to Total Adults (%)	Assets of Five Largest Banks, as a Share of Total Commercial Banking Assets (%)	Stock Market Capitalisation to GDP (%)	Stocks Traded, Total Value to GDP (%)
Uganda	20.46	72.64	15.39	0.1
Low-Income Countries	14.35	83.14	20.80	4.9
High-Income Countries	93.05	79.46	58.38	70.2

Source: Authors computation based on data from World Bank, (2012).

Table 2.5 shows that access to financial institutions remains low – at 20.46%, in comparison with that of HICs. The banking industry is concentrated, with the top five banks dominating the asset share. The stock market capitalization remains low; and

so does the volume of stock traded as the share of GDP. This reflects the low development of the financial markets (Berg *et al.*, 2013).

However, the Ugandan banks remain well-capitalised; and they have adequate capital buffers to withstand shocks, aided by high profits (BoU, 2013a). The leverage ratio², which is a new indicator of banks' capital adequacy, stood at 12.2% in June 2013, far above the minimum of 3%, as recommended by the Basel Committee on Bank Supervision (BoU, 2013a). Table 2.6 shows commercial banks level of profitability for Uganda from June 2009 to June 2013.

Table 2.6: Commercial Banks's Profitability for Uganda (2009 to 2013).

	June 2009	June 2010	June 2011	June 2012	June 2013
Net profit after tax in Uganda shillings (Billions)	280.8	224.0	354.7	587	500.7
Return on assets (%)	3.7	2.4	3.1	4.4	3.3
Return on equity (%)	25.8	16.1	22.4	29.5	20.4
Cost to income (%)	69.5	79.2	71.3	68.1	72.4

Source: Authors computation based on data from BoU, (2014).

Table 2.6 shows that the commercial banks maintain the trend of good profitability attributed mainly to the increase in net interest income (BoU, 2013a). However, BoU, (2012) shows that the commercial banks' asset quality had dropped as the

²The leverage ratio recommended in Basel III is computed as the ratio of the average three-month regulatory tier-one capital to total assets plus off-balance sheet items.

nonperforming loans to total gross loans ratio rose from 2.2 percent in December 2011 to 4.3 percent in 2012.

Uganda has experienced a significant growth of financial innovations³ over two decades to 2012. The number of ATMs rose to 714 in 2012 – from 25 in 2001 in comparison to 496 bank branches (BoU, 2012). There has also been the development of electronic funds transfer (EFT), the Real-Time Gross Settlement System (RTGS), debit and credit cards, and mobile money products (Opolot *et al.*, 2013).

Electronic Funds Transfers and mobile-money services were introduced in 2003 and 2009, respectively. Electronic Funds Transfers can be used for both credit transfers and direct debits. Mobile money services have also registered significant growth in terms of the volume of transactions, recording 92% growth between 2010 and 2012 (BoU, 2012).

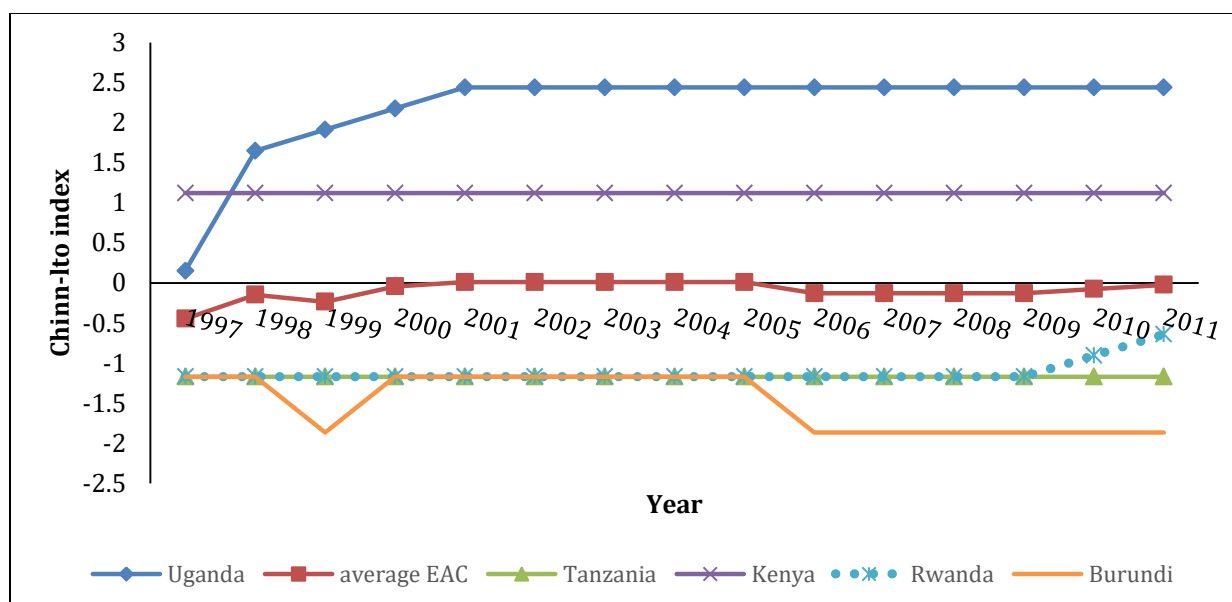
2.4.1 Exchange Rate Regime and Capital Account of Uganda

Uganda is classified by the IMF as a floating regime; and the authorities intervene in the foreign-exchange market, in order to maintain stability in the foreign-exchange market (Berg *et al.*, 2013; IMF, 2013b). Since 2010, the BoU has been conducting daily purchases for reserve build-up purposes, while engaging in targeted sales occasionally when necessary (Opolot *et al.*, 2013).

Uganda liberalised the capital account of its balance-of-payments in 1997 and since then has had no quantitative capital account controls on capital movements in or out of Uganda (Berg *et al.*, 2013). Chinn and Ito (2008) created an index that measures the extent of openness in capital account transactions, a higher value of which corresponds to fewer restrictions in international transactions. The index takes a maximum value of 2.5 for the most financially open economies, and a minimum of -1.9 for the least financially open. Figure 2.7 shows the Chinn-Ito financial openness index for Uganda Versus EAC countries for period 1997 to 2011.

³ Financial innovation is defined as the emergence of financial instruments and services, and of new forms of organization.

Figure 2.7: Chinn-Ito Financial Openness Index for Uganda versus EAC Countries (1997-2011)



Source: Authors computation based on data from Chinn- Lto (2015)

According to *de jure* Chinn and Ito (2008), using the updated financial index values of 2011 shown in Figure 2.7, Uganda scores 2.44. The index indicates that the Ugandan economy has been the most open economy in the East African region, since it liberalised its capital account. The index rose from 0.15 in 1997 to 2.44 in 2011. By comparison, the index for the United States and the United Kingdom in 2011 stood at 2.39. According to the *de facto* measure of the ratio of total external assets and liabilities to GDP for Uganda, the ratio has more than doubled – from 0.31 in 1991 to 0.66 in 2011 – indicating an increase in the degree of openness of the economy to international capital flows (Lane and Milesi-Ferretti, 2006).

Portfolio investments that were nearly zero in 1999 and US\$0.25 million in 2000 have increased to US\$1005 million in 2013. The most significant rise was from US\$ 335 million in 2012 to the 2013 figure. This could be attributed to the return differentials within the region (Opolot *et al.*, 2013).

Table 2.7 shows FDI Flows to EAC for period 2006 to 2012.

Table 2.7: FDI Flows to EAC (US\$ Billions)

	2006	2007	2008	2009	2010	2011	2012
Uganda	644	792	729	842	544	792	1720
Kenya	51	729	96	116	178	335	259
TZ	403	582	1247	953	1023	1095	1710
Rwanda	31	82	103	119	42	106	160
Burundi	0	1	4	0	1	2	1

Source: Authors computation based on data from United Nations Conference on Trade and Development (UNCTAD), 2013

Table 2.7 shows the flow of FDI, which was US\$55 million in 1993, has risen exponentially so that Uganda shows the highest receipt of FDI in the EAC, recording US\$1.72 billion in 2012, compared to Tanzania US\$1.71 billion (UNCTAD, 2013).

An alternative measure was constructed in 2007 by Dhungana (2008) that excludes concessional financing and the holding of foreign exchange reserves. Using the United States and Japan as benchmarks, this ratio was 2.78 for the United States, and 1.72 for Japan. For Tanzania, it was 0.53, and for Uganda, it was 0.48. Uganda has had an open capital account *de jure* since the late 1990s (Montiel, 2013). Further Montiel (2013) indicates that the *de facto* indicators concur in suggesting that the country has enjoyed only a limited degree of integration with international financial markets.

Since monetary policy operates through interest rates and asset prices, the exchange rate is likely to be an important mechanism in Uganda. The openness of the capital accounts has coincided with increased dollarization. Foreign deposits accounted for 33.8% of total deposits in December 2013 (BoU, 2013a). The sensitivity of domestic money demand to interest rates and inflation increases with the availability of ready substitutes for domestic money.

2.5 Challenges Facing Monetary Policy Effectiveness in Uganda

Uganda faces a number of challenges in designing monetary policy frameworks in a bid to achieve its objectives of low inflation and full employment output, as well as maintaining its financial stability. The constraints of monetary policy implementation are political, institutional, structural and technical in nature (Hammond *et al.*, 2009).

One of the main threats to efficacy of monetary policy is the lack of central bank independence (Hammond *et al.*, 2009). Over the last few years, monetary-policy costs have grown and account for 30% of the Central Bank's total operating expenditure (BoU, 2013b). This trend, if continued, will probably lead to the erosion of the Bank of Uganda's capital, and to the risk of the Central Bank's independence being compromised.

Uganda still has low levels of financial development, as shown in Figure 2.3 and Table 2.5 respectively. The low levels tend to mitigate the effective transmission of monetary policy into policy outcomes (Mishra *et al.*, 2012). Private sector credit, as a share of GDP, stood at about 15% in 2013. It is still low by regional SSA and HICs standards. *De facto* indicators concur in suggesting that the country has enjoyed only a limited degree of integration with international financial markets. To date, Uganda has had no issuance of international debt securities.

Uganda's banking sector has limited competition and, as shown in Table 2.5, the asset concentration is dominated by the five largest banks (Berg *et al.*, 2013). This, according to conventional wisdom, is likely to constrain the classical interest-rate channel. In addition, Ugandan commercial bank holds substantial excess reserves to an average of 30% of the required reserves, which could serve to prevent the operation of the monetary transmission mechanism. It is sometimes argued, specifically, that excess reserves imply that policy tightening is "pushing on a string"; and it is therefore, ineffective (Saxegaard, 2006).

As previously mentioned, Uganda has enjoyed steadfast growth in financial innovations; and it is destined for more innovations in the future, with more banks likely to come on board. The commitment to the 2024 - roadmap of East Africa Monetary Union should increase the potential of this trend in financial innovations. Financial innovations tend to increase the instability of the money demand through

the increased velocity of money as well to change the behaviour of economic agents (Weil *et al.*, 2012). This is likely to strengthen the interest rate and the exchange rate channels; and weaken the credit channel (Noyer, 2001; Weber, 2007).

In Uganda, since the monetary policy has been tailored towards targeting M2, it is likely that monetary policy will affect only the local currency, not foreign currencies (Davoodi *et al.*, 2013). While the CBR was changed from 11% (July 2011) to 23% (Nov 2011 to Jan 2012) to curb the inflation spiral, some banks reached an extent of extending loans only in foreign currency and not in local currency. Foreign deposits accounted for 33.8% of the total deposits in December 2013 (BoU, 2013b). This implies the more foreign deposits as share of M3, the less likely will monetary policy be effective, and this also improves the scope of cross-border spill-overs (Szpunar and Głogowski, 2012). Table 2.8 shows exposure to foreign currency risks for Uganda for period June 2009 to June 2013.

Table 2.8: Exposure to Foreign Currency Risks for Uganda

Year	June 2009	June 2010	June 2011	June 2012	June 2013
Foreign currency deposits to total deposits	27.4	29	30.1	34.9	33.2
Foreign currency loans to total loans	22.8	24.8	28.9	35.2	39.7
Foreign currency assets to total assets	24.9	25.3	26.6	33.2	30.8

Year	June 2009	June 2010	June 2011	June 2012	June 2013
Foreign currency assets to foreign currency liabilities	111.3	98.4	100.1	103.4	104.9
Foreign currency loans to foreign currency deposits	57.3	52.1	64.2	63.2	72.8

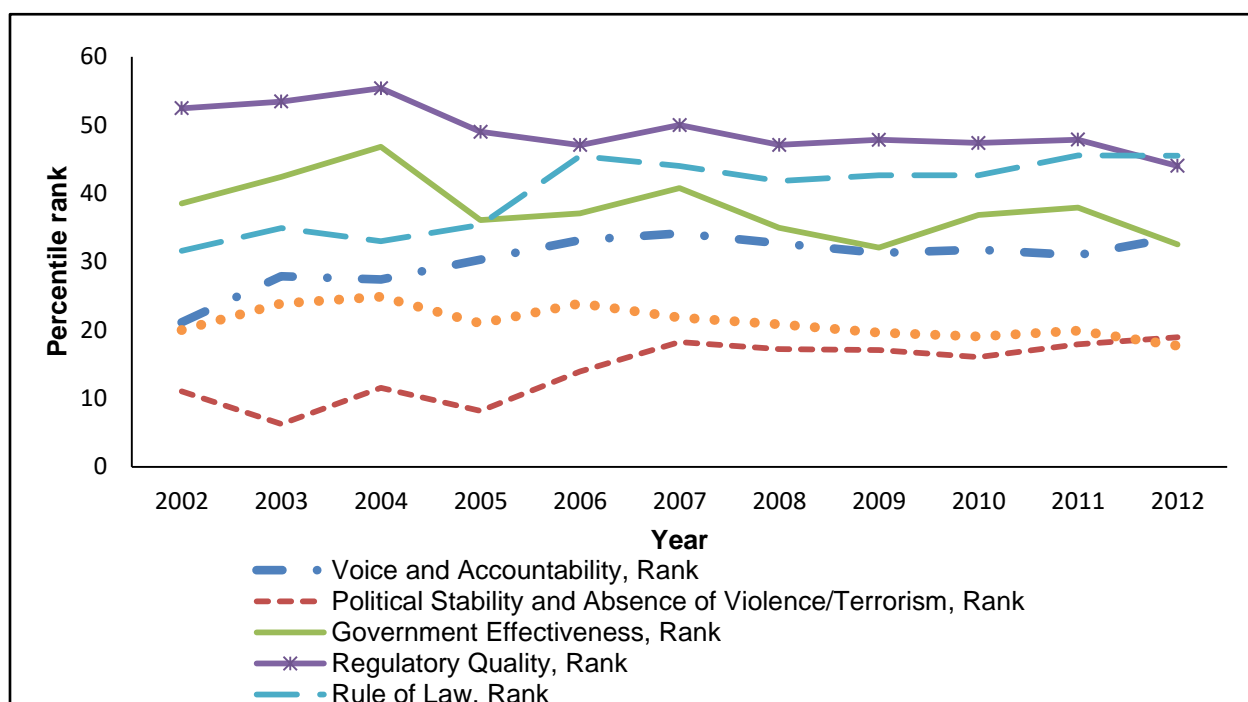
Source: Authors computation based on data from BoU (2014).

Table 2.8 shows that there was a marked growth in foreign currency loans, assets and deposits from June 2009 to June 2013.

The effectiveness of monetary policy depends on the magnitude of financial frictions, which are in part contingent upon the institutional and regulatory environment. Financial frictions tend to increase financial intermediation costs – including but not limited to – loan-evaluation costs, monitoring costs, and contract-enforcement costs. The magnitude of these costs depends on the quality of the domestic institutional environment (the security of property rights, the quality and enforcement of its accounting and disclosure standards, as well as on its bankruptcy laws, and the efficiency of the domestic system, as well as on the domestic borrowers (Mishra *et al.*, 2010; Montiel, 2013).

According to Montiel (2013), direct measures of these factors are not available, but since they are all particular aspects of a country's general institutional environment for the performance of economic activity, more general indicators of such institutional quality are likely to be correlated with them. Figure 2.8 shows the institutional quality indicators for Uganda from 2002 to 2012.

Figure 2.8: Institutional Quality Indicators for Uganda (2002-2012)

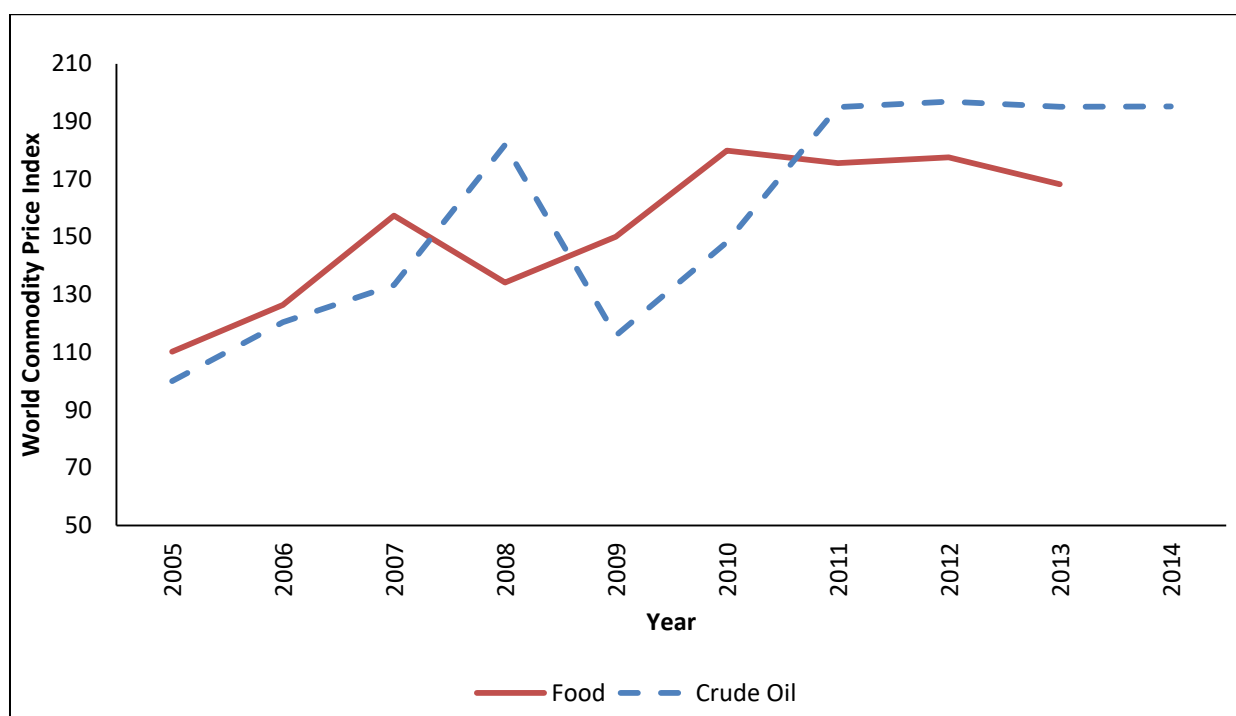


Source: Authors computation based on data from World Bank (2013)

According to the World Bank (2013), the institutional quality indicators shown in Figure 2.8 reveal that Uganda has low rankings in the area of government effectiveness and the control of corruption. This suggests that the government-provided public goods, on which the financial system is based, may not be as readily available in Uganda, as they are in some other countries. The relative scarcity of such public goods would tend to make financial intermediation a costly activity, thereby limiting the transmission of monetary policy, and in part explaining the size of the formal financial sector.

Over the last 6-8 years, Uganda has encountered exogenous shocks – in particular, the terms-of-trade shocks (reflecting food and fuel prices) that have posed challenges to the performance of monetary policy (Berg *et al.*, 2013). Figure 2.9 shows the World Commodity Prices Index for period 2005 to 2014.

Figure 2.9: World Commodity Prices (Index 2005=100)



Source: Authors computation based on data from International Financial Statistics (2014)

Since 2003, two significant increases in world food and energy prices have been recorded, as illustrated in Figure 2.9. The first surge took place just prior to the world financial crisis in 2008, with food prices soaring. On the other hand, oil remains the most important source of primary energy in the world, accounting for about 33 per cent of the total. The two other fossil fuels, coal and natural gas, account for 28% and 23%, respectively (IMF, 2014c).

This resulted in substantial inflation pressures in Uganda as shown in Figure 2.2. The second major commodity price shock occurred in 2010-11; and the Ugandan inflation took off again, recording an annual inflation rate of 18.6% in 2011, and 14% in 2012. Subsequently, economic growth in 2012 took a tumble – recording the lowest rate in over two decades at 2.78% (Berg *et al.*, 2013). These shocks (imported food and fuel) inflation tend to weaken the monetary transmission mechanism, particular through the exchange rate channel.

Uganda has also not been immune to domestic shocks. Inflation in the last few years has soared into double figures – considerably higher than the annual target of 5%. The high volatility in inflation is attributed to the high share of food items in the overall Consumer Price Index (CPI), in line with the economic structure. The domestic food

prices have been largely attributed to weather patterns, which are characterized by a bimodal annual rainfall cycle.

The weight of food in the CPI in Uganda is 27%, reflecting the economic structure which is largely agriculture and subsistence based. The CPI survey does not include the rural households. In addition, the agricultural sector, being largely non-monetized, makes the performance of monetary policy difficult.

While the central bank has over the years managed to evade the impossible trilemma, the multiple objectives have not entirely disappeared, with concerns about the exchange rate and balance of payment along with maintaining high growth rates remaining high on the Central Bank's radar (Adam, 2009). The Central Bank also cannot ignore the banking system when pursuing its monetary policy objective. In some circumstances, when the economy has faced a supply shock, as was the case in 2011, there was an unavoidable conflict between achieving both inflation and output targets. In that particular circumstance, the inflation target took precedence (Tumusiime-Mutebile, 2012).

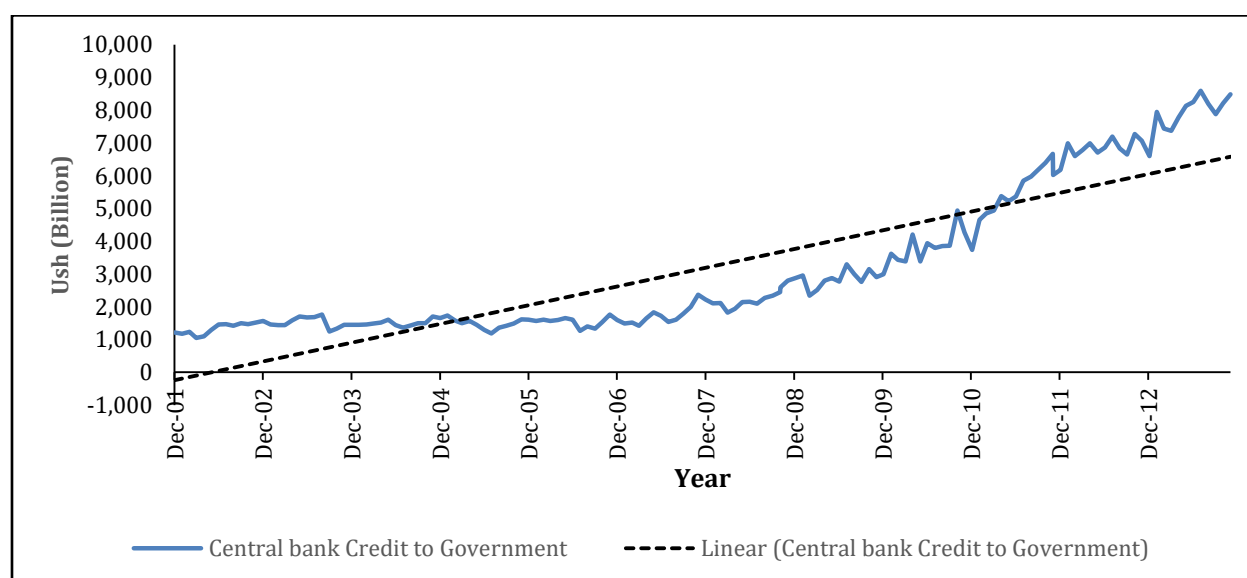
While the multiplicity of policy instruments increases the credibility of the central banks, the many instruments for Uganda illustrated in Table 2.3 may risk having conflicting impacts; or least risk weakening the transmission mechanisms. This also makes it difficult to accurately interpret the exact impact of the respective instruments.

Increased government domestic borrowing tends to increase interest rates, crowding out the private sector and resultantly leading to lower output. This often comes in conflict with monetary policy, in trying to meet its ultimate objectives of low stable inflation and higher growth rates. Persistent fiscal indiscipline, including high fiscal deficits funded through domestic markets insubordinates the monetary policy to fiscal policy; and the expectations of economic growth and inflation are hinged on fiscal policy (Hammond *et al.*, 2009).

Between 2007 and 2012, Uganda's domestic debt stock picked up from 9% to 13.1% of GDP, while the external debt increased by 4.8% to 17.1%. Overall, the total public debt grew by 8.9% to 30.3% (IMF, 2013a). The increase in the total public debt is due

to the rising fiscal deficit (including grants), which fiscal gap is projected to widen from about 4% of GDP in 2012/13 to 5.25% of GDP in the medium term, peaking at 7½% of GDP in 2013/14 (IMF, 2013a). Figure 2.10 shows the central bank credit to government for the period 2001 to 2012.

Figure 2.10: Central Bank Credit to Government of Uganda (2001-2012)



Source: Authors computation based on data from BoU (2014)

Domestic debt has also encountered a sizeable leap since 2008. This is explained by increase in central bank credit to government shown in Figure 2.10. This could be attributed to fact that the primary auctions of government securities since 2011 are used to fund the government domestic borrowing requirement and to refinance the existing stock of securities, as they mature rather than as an instrument of monetary policy (Tumusiime-Mutebile, 2012).

In addition in 2010/11, there were fiscal slippages stemming from an attempt to reverse the pro-cyclicality of fiscal policy, as well as election-related spending. This led to domestic borrowing to the tune of 1.3% of GDP, in violation of the IMF agreed assessment target for net credit to government (IMF, 2010).

When the capital account of the balance of payments, the economy may sometimes experience volatile capital flows, thereby making the performance of monetary policy

complex. Eventually, the impossible trinity problem of the Central Bank managing the volatile exchange rate amongst other monetary objectives may emerge. The problem could be magnified by the fact that Uganda also has a large informal capital account (Adam, 2009). In addition, the capital inflows are often associated with asset prices booms, especially in underdeveloped financial markets; and portfolio investments tend to be volatile, especially when there are incentives for cross-border investments. Prasad and Rajan (2008) advised against greater openness of the capital account; and they proposed moderate tax on capital flows. The journey to oil production in the next few years will be associated with higher levels of both the portfolio and direct investment flows (BoU, 2013b). These flows are likely to be volatile as well.

Aid, just like capital inflows, comes with an appreciation of the exchange rate; and it increases money and net domestic assets. Despite Uganda experiencing a significant decline in aid flows, such aid flows are still significant. The aid flows to Uganda have been volatile and unpredictable. In the recent past, the volatility has been strongly linked to the political and governance issues, as well as to the development of human rights movements (Williamson *et al.*, 2016). The sudden decline in aid could exacerbate the fiscal deficits – leading in all likelihood to higher domestic funding or at least, the inflation target could be relaxed (Adam, 2009).

The choice of monetary policy stance becomes complex as it has to factor in a number of elements, *inter alia*; higher consumption patterns, corruption and capacity to absorb the aid inflows. The shift to budget support in the mid-2000s posed exchange rate volatility and liquidity management challenges for the Central Bank, as budget support was associated with increased domestic credit creation (Brownbridge and Tumusiime-Mutebile, 2007).

While inflation-targeting lite has been successful in bringing down inflation, the transition to fully fledged inflation targeting will in part be challenging to the Bank of Uganda (Adam, 2009). The transition will require understanding the clear monetary transmission mechanisms; analytical infrastructure for a forward-looking approach to monetary policy; financial autonomy of the Central Bank; robust institutional frameworks; and enhanced capacity to successfully manage the impossible trinity. This requires the availability of good macroeconomic data to inform their decisions

(Hammond *et al.*, 2009). A key challenge is also whether the commercial banks that have excess reserves will continue to respond to the monetary policy signals.

The transition to the EAMU poses challenges to the conduct of monetary policy in the respective individual East African countries. This will require radical changes to the exchange rate policy, as well as to monetary policy (Tumusiime-Mutebile, 2010).

2.6 Conclusion

Uganda has over the years shifted from direct controls of interest rate and credit to basic money targeting, as during the 1990s, agreed upon under the IMF/ WB structural adjustment programmes. The Reserve Money Programme remained in place until June 2011, when BoU moved from monetary targeting to Inflation Targeting Lite. The economy has since the early 1990s experienced low levels of inflation and high levels of economic growth. This performance can be attributed to the legacy of a long record of sound macro-economic policies (including monetary policy) that created a stable platform for growth. Since the dawn of economic reforms in 1986, there has also been substantial growth in the financial architecture. However, in recent years, the economy has been subjected to a number of internal and external shocks. In particular, the global terms of the trade shocks of 2008-09, associated with high global fuel and food prices. And thereafter, the global financial and economic crisis, both posed major challenges for monetary policy in Uganda.

This chapter has also explored a number of challenges impacting on the effective performance of monetary policy in Uganda. In part, these are; technical, structural, institutional and political. The current monetary practice of inflation-targeting lite has generally delivered results in the short run; however, the under-developed financial sectors, especially the financial markets, make the transmission of the policy objectives tricky or weak. Short-term interest rates remain a credible intermediate target; but there is a heightened need to develop and deepen the financial sector. Frequent examination of the transmission mechanisms remains critical. Increasing fiscal deficits are disruptive; and they have, in part, led to increased domestic borrowing – leading to the crowding out of private sector credit – thereby, subduing private sector growth over the last couple of years. The fiscal deficits, and in

particular the segment funded by domestic borrowing, needs to be lowered to ensure an effective fiscal monetary policy mix.

While Uganda has been successful in avoiding the impossible trilemma, the transition to fully fledged inflation targeting will likely pose trilemma challenges. The openness of the capital account, the envisaged oil production-related capital inflows, and the multiple objectives undertaken by the central bank could heighten this challenge. Continuing to monitor the trends of these key variables should advise future actions and monthly communication of the policy statements. Lastly, independence of the Central Bank – both institutional and operational – is critical in the performance of monetary policy. It is even more critical with the adoption of inflation-targeting lite, as this enhances the credibility of the Central Bank. Recapitalization of the central bank and the strengthening of independence via the Bank of Uganda Act would be essential for the transition to fully fledged inflation targeting.

CHAPTER THREE

3. MONETARY POLICY AND ECONOMIC PERFORMANCE IN KENYA

3.1 Introduction

This chapter provides an overview of Kenya's economic, monetary and financial reforms – since its independence in 1963. It explores the economic and monetary performance over the years; and highlights the challenges facing the conduct of monetary policy. In particular, the chapter assesses the respective monetary policy frameworks, and the associated economic performance from 1963 to 2014. The chapter also explores a number of challenges that the current policy framework faces; in particular the intricacies associated with financial innovations, the under developed financial markets, pursuance of multiple objectives at times competing and recent rising trend of domestic debt.

The chapter is divided into six (6) sections. Section 3.2 outlines the main features of Kenya's monetary regime and the associated economic performance from 1963 to 1985. Section 3.3 explores the monetary policy environment from 1986 to 2014. The associated economic and financial performance, including the financial structure, is presented in Section 3.4. Section 3.5 highlights the challenges to the effective conduct of monetary policy in Kenya, and finally Section 3.6 concludes the chapter.

3.2 Monetary Policy Regime and Economic Performance in Kenya (1963-1985)

Kenya, which attained its independence in 1963, has historically been and remains the largest economy in the East Africa Community in terms of its GDP size (World Bank, 2015). Post-independence has been associated with significant economic and financial reforms, which in part explain the momentous levels of economic and financial development, manifested in higher levels of economic growth, low and stable inflation, positive trade balances and significant growth in money supply and private sector credit as shares of GDP (Kinyua, 2001).

Post-independence monetary policy was controlled by the East Africa Currency Board (EACB) that also served Uganda and Tanzania. It was until 1966 that the EACB broke down, leading to the creation of the Central Bank of Kenya (CBK) by the Act of Parliament – the Central Bank Act (CAP 481) – and was mandated to execute all functions of the Central Bank (Kinyua, 2001). Further Kinyua (2001) notes that monetary policy, thereafter, was conducted through direct controls; and that domestic credit was the intermediate target, and the minimum reserve requirement was fixed at 12.5% of the commercial banks deposit liabilities in 1969.

Interest rates were controlled, exchange rates fixed and the CBK held the significant shares of the foreign exchange since it took over the custody of the foreign exchange in 1967 (Killick and Mwega, 1990). Also, Killick and Mwega (1990) indicate that positive real interest rates were recorded at an average of 1.9% between 1966 and 1990. Statutory limits higher than EACB limit were instituted on the government borrowing from banks. While the increasing fiscal deficits were recorded from 1965 through the remaining part of 1960s, limited borrowing from central bank and printing of money was observed. In addition, the Treasury bills were significantly held by CBK. The exchange rate encountered episodes of devaluation following the first post-independence balance of payments test in 1967 and another in 1969 (Kinyua, 2001).

Moderate financial repression was observed, CBK held a direct significant influence over the behaviour of the banks and non-banking institutions, also known as moral suasion. At independence, the banking sector in Kenya was comprised of nine foreign commercial banks, dominated by few London based banks, in particular, the Barclays, Standard Chartered and National and Grindlays, along with a few other financial institutions such as the Post Office Savings Bank and several Non-bank Financial Institutions (NBFIs) and Development Finance Institutions (Brownbridge, 1996b). Table 3.1 shows the selected economic indicators for Kenya over the period from 1960 to 1970.

Table 3.1: Selected Economic Indicators for Kenya (1960-1970)

Year	Domestic Credit to Private Sector (% of GDP)	GDP Growth (Annual %)	Gross Domestic Savings (% of GDP)	Gross Fixed Capital Formation (% of GDP)	Gross National Expenditure (% of GDP)	Inflation, Consumer Prices (Annual %)	Money and Quasi Money (M2) as % of GDP
1960	-	-	17.14	-	102.57	-	-
1961	12.31	-7.77	16.78	-	98.41	2.46	3.92
1962	11.80	9.46	16.47	-	98.09	3.12	4.39
1963	13.18	8.78	16.01	-	96.93	0.70	4.44
1964	13.69	4.96	17.24	12.42	95.82	-0.10	4.29
1965	13.76	2.01	15.10	12.82	99.30	3.58	5.37
1966	12.61	14.73	20.15	14.72	98.46	5.01	22.66
1967	14.58	3.36	19.26	18.67	100.91	1.76	23.69
1968	12.89	7.98	20.15	18.52	99.90	0.37	23.97
1969	12.73	7.96	20.81	17.99	98.56	-0.17	26.38
1970	15.12	-4.66	23.56	19.68	100.84	2.19	30.61

Source: Authors computation based on data from World Bank (2014)

Table 3.1 illustrates that Kenya experienced strong macro-economic performance, exhibited by high growth rates, positive balance of payments and low inflation in the 1960s. Despite recording negative real GDP growth rate in 1970, real GDP averaged 4.7% between 1963 and 1970, inflation was stable and low at an average of 2 %, and balance of payments surplus were recorded except in 1967 and 1969, also shown in Table 3.1. Further, Table 3.1 shows that the high growth rates were associated with high savings rates and high investments coupled with significant national expenditure-an average of 99% of GDP in the 1960s. Despite Inflation rates being low and stable, money and quasi money (M2) as percentage of GDP grew from 3.9% in 1961 to 30.6% in 1970 (see Table 3.1).

In the 1970s, however, the economy faced a number of shocks, some of which were: The collapse of the Bretton Woods system of fixed exchange rates in 1971; the oil shock in 1973/74; the drought in 1979; and the positive boom of high coffee price in 1975 (Killick and Mwega, 1990). These shocks – except the coffee price boom – had far-reaching effects on the economy that manifested in worsening balance of payments, dwindling real GDP growth rate, and double digits inflation (Killick and Mwega, 1990). Table 3.2 shows selected economic indicators for Kenya between 1971 and 1980.

Table 3.2: Selected Economic Indicators for Kenya (1971-1980)

Year	Domestic Credit To Private Sector (% of GDP)	GDP Growth (Annual %)	Gross Domestic Savings (% of GDP)	Gross Fixed Capital Formation (% of GDP)	Gross National Expenditure (% of GDP)	Inflation, Consumer Prices (Annual %)	Money and Quasi Money (M2) as % of GDP	Interest rate Spread (Lending Rate Minus Deposit Rate, %)
1971	17.43	22.17	17.37	22.70	106.55	3.78	29.67	5.50
1972	16.49	17.08	20.18	21.76	102.14	5.83	28.54	5.50
1973	21.94	5.90	24.54	20.45	101.28	9.28	30.49	5.50
1974	21.94	4.07	18.53	19.12	107.22	17.81	25.71	5.19
1975	21.76	0.88	13.45	20.21	104.69	19.12	27.39	4.87
1976	21.68	2.15	20.93	19.98	99.31	11.45	28.18	4.87
1977	22.27	9.45	27.02	20.97	96.63	14.82	32.80	4.87
1978	27.58	6.91	20.01	25.08	109.75	16.93	34.53	4.87
1979	27.27	7.62	16.43	19.17	101.70	7.98	34.35	4.87
1980	29.48	5.59	18.12	18.32	106.39	13.86	29.93	4.83

Source: Authors computations based on data from World Bank (2014)

As shown in Table 3.2, the levels of inflation seemed to have had a positive co-movement with the increased share of M2 as share of GDP and the persistent high share of national expenditure as % of GDP – over 100 %. Due to the oil crisis, the terms of trade deteriorated by 22% between 1972 and 1975, however the terms of trade – following the coffee – tea boom improved thereafter by 53% between 1975 and 1977 (Swamy, 1994). Real GDP growth rate that was 22% reduced in 1971 to 5.6% in 1980 while the M2/GDP ratio remained virtually unchanged during the 1970s, despite increasing marginally by 4% between 1977 and 1979 (see Table 3.2). The large government borrowing and growing fiscal deficits over the same period were funded through domestic borrowing (Kinyua, 2001).

A number of measures were undertaken in the early 1970s. Monetary policy that was largely inactive in the 1960s was then subject to a number of changes. The liquidity ratio requirement was changed a couple of times in the 1970s, starting with the liquidity ratio being raised to 15% in 1972 – on top of removing the cash ratio. The 15% liquidity ratio requirement was further extended to cover the NBFIS in 1974; and the Treasury bill was increased from nearly 0% to 6% (Kinyua, 2001). Moral suasion was also used as an instrument subjecting commercial banks to reduce their lending to the import sector and foreign owned firms. There was also a shift from Kenya shilling alignment to the US dollar to the Special Drawing Rights (SDR) in 1975; and this marked the first step of engaging with IMF to reverse the economic trend and mitigate domestic and external shocks (Kinyua, 2001).

Interest rates remained controlled. Elements of moderate financial repression remained exhibited by continued fixing of the exchange rate, increased government borrowing from the commercial banks, and moral suasion practice. In addition to increased control of the bank sector, government's own bank, Kenya Commercial Bank, was established in 1970 (Killick and Mwega, 1990). Interest rate spread averaged 5.1% annually in the 1970s, way below the annual average inflation rate of 12.1% leading to negative rates of return. The real interest rates were negative through the 1970s averaging 7.45% between 1971 and 1980. According to Killick and Mwega (1990), this in part discouraged the development of the banking sector.

The number of commercial banks that were eleven (eight foreign and three domestic banks) in 1971 reduced to four by 1980 and were all foreign-owned. On the contrary, the NBFIs that were six nearly doubled to eleven over the same period and eight were locally and privately owned. This was partly explained by the regulatory differences for the two institutions coupled with the negative interest rates on both loans and deposits, especially for commercial banks (Brownbridge, 1996b).

From 1978 through to 1982, the economy deteriorated, in part explained by severe drought of 1978/79, the second oil crisis and normalisation of the world prices of coffee and tea in the early 1980s. These shocks further deteriorated the economy as exhibited by deteriorating balance of payments and double-digit inflation (Kinyua, 2001). A number of measures were undertaken to counter and stabilise the economy. These measures included but were not limited to: Raising of the liquidity reserve ratio and the discount rate; the re-introduction of the cash ratio; limiting credit to the private sector to only 18%; and the institution of more controls on exchange rate (Kinyua, 2001).

In 1979, the IMF and Kenya agreed on the first structural adjustment loan but no actual disbursements were made until 1980 when balance of payments support was necessary to mitigate any related consequences of the second oil shock (Swamy, 1994). The respective structural reforms aimed at removing controls on prices, trade and credit, while also driving structural reforms to address the supply side shocks. The reforms also targeted fiscal and monetary policy including rationalisation of expenditure, adopting flexible exchange rate and reducing controls on trade and credit (Swamy, 1994).

These measures did not have a lasting effect, as fiscal deficits averaged 8% annually compared to the 3-4% of the early 1970s. Principally borrowing from the domestic market continued - averaging 8% annually and the debt service ratio had increased to 13.2% in 1980 from under 4% in 1977 (Killick and Mwega, 1990).

At the dawn of 1980s, most of the economic indicators were discouraging especially when compared to the post-independence decade's economic performance. In particular, the 1981 and 1983 period encountered poor economic performance. The current deficit as share of GDP was 12.5% in 1981, inflation increased to over 20% in

1982, real GDP declined to 1.3% in 1983 and debt service ratio increased to over 25 % (Swarmy, 1994). Additionally Swarmy, (2014) notes that this prompted Kenya to approach the IMF for a second adjustment loan in 1982.

As part of the IMF adjustment programme in 1982, it was agreed to increase the controlled interest rates to ensure that the positive or near positive real interest rates go forward. The interest rate spread was also reduced to 2.3% in 1982 from the average of 4.8 % in 1980. From 1982, a crawling peg exchange rate system anchored to a basket of currencies was adopted (Swarmy, 1994). Monetary policy continued to operate through the direct measures, in particular using credit restrictions, fixed cash ratios, and liquid asset ratios as well as setting minimum deposit and maximum lending rates. Regulatory parity and interest rate parity between commercial banks and NBFIs was ultimately established in the mid-1980s. The interest rates before 1980, were set attractively for NBFIs than banks, attracting a significant share of the deposits and loan portfolio. Government borrowing from the banking system was also significantly reduced. The growth in commercial banks remained subdued, some banks closing between 1980 and 1985, while the growth of NBFIs continued, the number growing to 19 in 1985 (Brownbridge, 1996b). Table 3.3 shows selected economic performance indicators for Kenya between 1980 and 1985.

Table 3.3: Selected Economic Performance Indicators for Kenya (1980-1985)

Indicator	1980	1981	1982	1983	1984	1985
Domestic credit to private sector by banks (% of GDP)	21.81	21.00	20.44	19.32	18.99	19.33
Domestic credit to private sector (% of GDP)	29.48	29.40	29.99	29.35	30.55	31.53
Foreign direct investment, net inflows (% of GDP)	1.09	0.21	0.20	0.40	0.17	0.47
GDP growth (annual %)	5.59	3.77	1.51	1.31	1.76	4.30
Gross capital formation (% of GDP)	24.51	22.91	21.86	20.93	19.81	25.32
Gross domestic savings (% of GDP)	18.12	19.55	16.96	18.66	14.51	20.48
Gross fixed capital formation (% of GDP)	18.32	18.61	19.03	18.11	17.15	17.27
Gross national expenditure (% of GDP)	106.39	103.36	104.90	102.26	105.30	104.85
Gross savings (% of GDP)	17.22	19.56	15.06	18.50	14.06	20.15
Inflation, consumer prices (annual %)	13.86	11.60	20.67	11.40	10.28	13.01
Interest rate spread (lending rate minus deposit rate, %)	4.83	3.57	2.30	2.56	2.65	2.75
Money and quasi money (M2) as % of GDP	29.93	29.47	30.42	28.18	28.34	26.68
Official exchange rate (LCU per US\$, period average)	7.42	9.05	10.92	13.31	14.41	16.43

Source: Authors computations based on data from World Bank (2014)

Economic performance between 1982 and 1984, as portrayed in Table 3.3, was sluggish. Inflation stayed in double digits; economic growth remained between 1-2%; growth in domestic credit as share of GDP hardly increased; interest rate spread marginally improved; money supply as share of GDP remained stagnant at 28-29%; and real interest rates remained negative. As further illustrated in Table 3.3, the official exchange rate (Kenyan shilling per US\$, period average) appreciated by over 100% between 1980 and 1985 and the levels of Foreign Direct Investment (FDI) as share of GDP reduced by 50%. The dismal economic performance is partly attributed to the attempted military takeover of the government in 1982 as well as the recurring drought in 1984 and dwindling investment (Killick and Mwega, 1990).

The post-independence period leading to 1985 was characterised largely by an ineffective monetary policy that was subservient to fiscal policy. It was passive in the first decade after independence since inflation was low, and thereafter was dominated by the fiscal policy due to increased expenditure pressure in the late 1970s and early 1980s (Kinyua, 2001). The main monetary tools were credit controls and imposition of ceilings particularly on commercial banks. The weak monetary policy coupled with expansionary fiscal policy, periodic droughts and oil crisis, in part, led to inflationary pressures over the years. The interest rates remained administered and negative in real terms over the period and the exchange rate was fixed until the early 1980s (Killick and Mwega, 1990).

Despite sustained financial repression over the corresponding period, there were increased levels of financial deepening. Money supply (M2) as share of GDP increased from just 4% at independence to 27% in 1985, although it had reached 30% in late 1970s (Kinyua, 2001). The rapid growth in NBFIs is attributed to favourable differential requirements and regulation in comparison to the commercial banks, prompting the latter to own significant shares in NBFIs. The first adjustment programme of the IMF agreed in early 1980s was not successful in reversing economic trends, prompting further structural adjustments in the mid-1980s until the 1990s (Kinyua, 2001).

3.3 Monetary Policy Reforms and Economic Performance in Kenya (1986-2014)

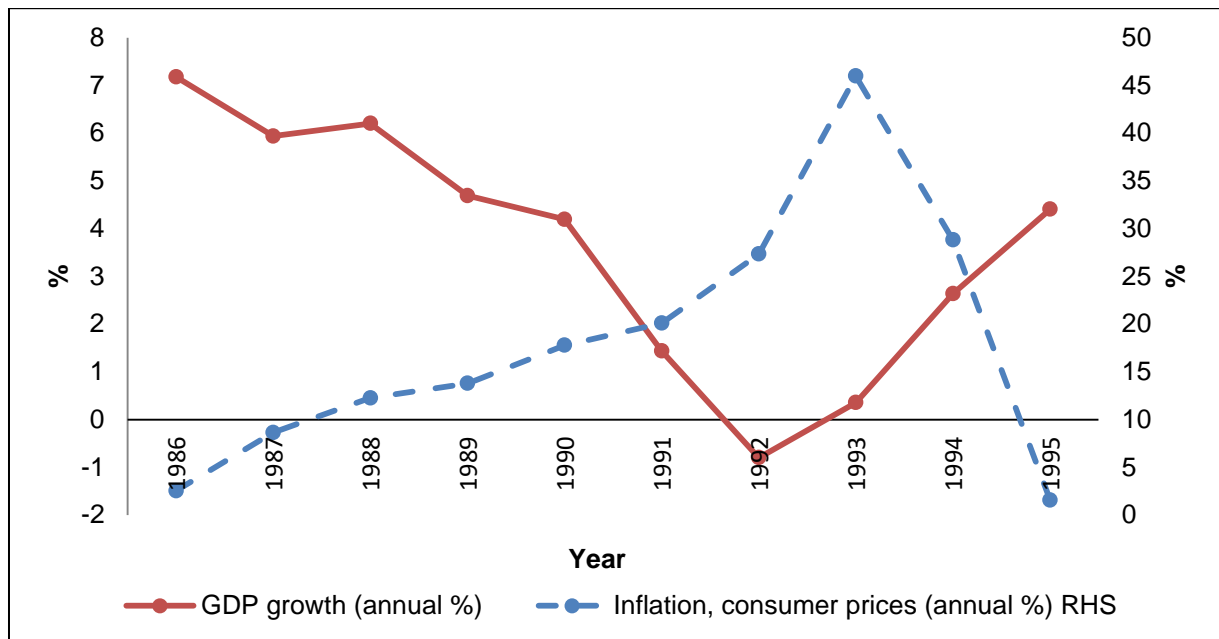
The year 1986 heralded the dawn of major reforms agreed under the new Structural Adjustment Programmes (SAPs) integrated into the macroeconomic management policies. The SAPs aimed mainly at reducing inflation, increasing sectorial efficiency and restoring the sustainable balance of payments (Rono, 2002). In particular, Rono, (2002) highlights that the SAP reforms *inter alia*, included the liberalisation of prices and marketing systems; financial sector policy reforms; international trade regulation reforms; restoration of fiscal discipline; divestiture and privatisation of parastatals and civil service reforms.

The financial sector policy reforms aimed in part, at increasing the competition in the financial sector, and at increasing the range of financial instruments through an expanded financial infrastructure. It also targeted the deregulation of interest rates, improving the overall process of financial intermediation, mobilisation, and the allocation of resources (Rono, 2002). Further in 1986, Treasury bonds were introduced, the cash ratio was re-introduced, at the rate of 6%, and the liquidity ratio was raised to 20% (Nyamwogo and Ndirangu, 2013).

Between 1986 and 1990, a couple of structural adjustment facilities were agreed with the IMF and the World Bank. In 1988, two facilities were agreed; the first aimed at reducing overseas borrowing, budget deficits as share of the GDP, and maintaining positive real interest rates while the second aimed at reducing trade tariffs and controls. Further in 1989, an Enhanced Structural Adjustment Facility (ESAF) was agreed to reinforce the objectives of price de-control and reducing fiscal deficits (Rono, 2002). In addition, a financial sector reform aimed at financial liberalisation while reinforcing the central bank's regulatory capacity through review of the Banking Act was done in 1989 (Gertz, 2009).

Figure 3.1 shows selected economic indicators for Kenya for the period from 1986 and 1995.

Figure 3.1: Selected Economic Indicators for Kenya (1986-1995)



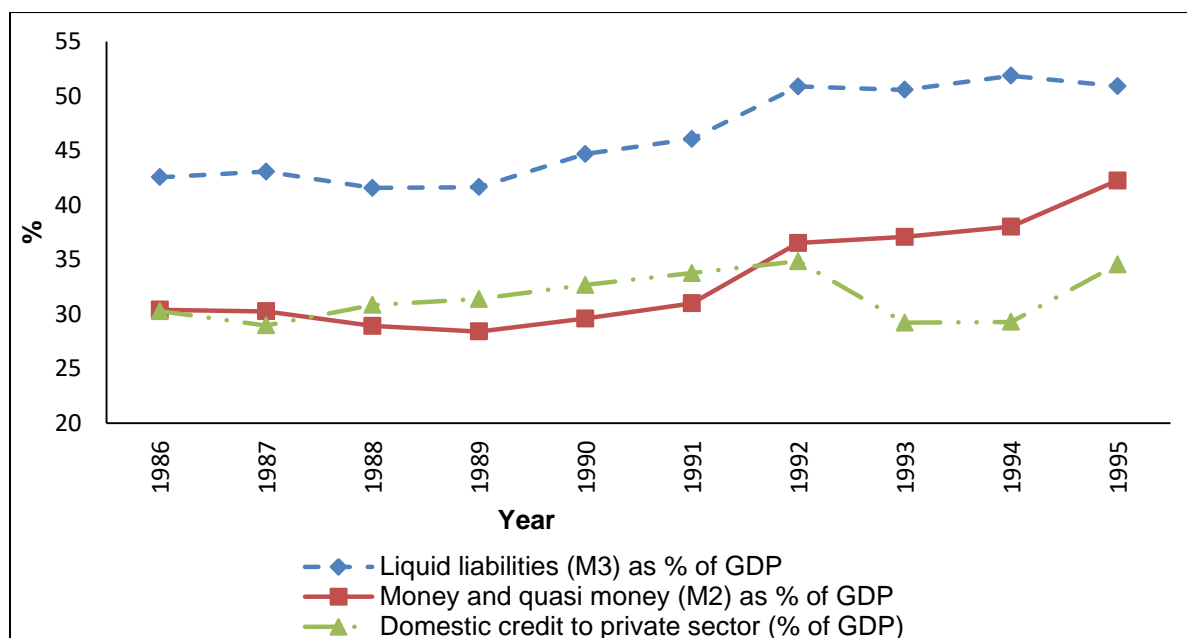
Source: Authors computations based on data from World Bank (2014)

While 1986 is regarded as the crucial point for the key reforms, it was associated with a financial crisis – with a couple of NBFIs defaulting on their obligations (Kinyua, 2001).

Figure 3.1 shows that inflation, which had eased to just 2.5% in 1986, increased again to double digits in 1986, and continued to rise through to the mid-1990s while growth continued to slow reaching negative rates in 1992. The high inflation rates rendered the real interest rates negative, despite the attempt to raise the interest rates (Kinyua, 2001). Further, also shown in Figure 3.1, the raising of the savings rate to 12.5% and 15% in 1989 and 1990, respectively, was not enough to attain positive real interest rates. Economic growth, however, picked up in 1993, and started to grow, at positive rates (Kinyua, 2001).

Figure 3.2 shows selected financial depth indicators for Kenya 1986 to 1995.

Figure 3.2: Selected Financial Depth Indicators for Kenya (1986-1995)



Source: Authors computations based on data from World Bank (2014)

Figure 3.2 shows that, levels of financial deepening continued into the mid-1990s. This progress was impressive against the backdrop of financial repression from the early 1960s being sustained through to the mid-1990s (Kinyua, 2001).

The 1990s became the true era of key reforms actualisation. Initial important steps to liberalise the foreign exchange market begun in 1990, adopting a dual exchange rate which entailed tracking the official exchange rate and the market rate available. This was done through creation of a legal free market for foreign exchange and the government issued foreign exchange bearer certificates. Complete liberalization of the exchange rate was achieved in October 1993, when the exchange rate was allowed to be market determined (Maehle *et al.*, 2013).

In 1991, Capital Markets Authority (CMA), the supervisory body in-charge of capital market developments in, Kenya was set up. Further steps were undertaken in 1994, with the relaxation of all the restrictions on current account transactions including the removal of all export taxes and allowing exporters to retain 100% of their foreign

exchange proceeds in foreign exchange accounts (O'Connell *et al.*, 2010). In addition, O'Connell *et al.* (2010) underscore that restrictions on outward investments and inward investments were removed in 1994 and 1995 respectively, marking the complete removal of the quantitative controls on the capital account controls.

The era of the liberalisation of the exchange rate and capital account between 1993 and 1995 was associated with a significant surge in both foreign exchange outflows in 1993 and inflows in 1994/95 (Maehle *et al.*, 2013). The Kenyan shilling suffered sizeable weakening owing to foreign outflows and the stagnant growth of exports for the period 1990-92. In response, government adopted the third export promotion policy that entailed fully refunding the import taxes paid on inputs used in the production of exports (Maehle *et al.*, 2013). Subsequently, Kenya started to experience large inflows of foreign exchange in part, explained by the high interest rates associated with increased liquidity mop up through issuance of large volumes of treasury bills and the interest rate differentials were in favour of the Kenyan shilling (Maehle *et al.*, 2013).

The liberalisation reforms were continued into the 1990s, and the lending rate and the maximum interest rate spread were fully harmonized by 1990 for both banks and NBFIs. Liquidity ratios were harmonized later in July 1995 at 25%. In 1991, the first step in liberalising the interest rates was implemented – with the first auctioning of treasury bills in the primary market (Kinyua, 2001). The method of Treasury bid auctioning was reformed further in 1993, with the volumes to be sold in the primary market auctions contingent upon the Central Bank's determination of fiscal needs and the prevailing monetary circumstances. The CBK determined the volumes on the weekly auctions (Kinyua, 2001).

Following the increased government borrowing associated with government expenditure related to the elections in 1992, large quantities of Treasury bills were issued to curb the inflationary spiral – subsequently leading to high interest rates and the associated negative impact on private investments (Kinyua, 2001). Fiscal costs associated with sale of the treasury bills rose rapidly, the domestic interest payments accounting for 93% and 90% of end period for 1992/93 and 1993/94 respectively (IMF, 1995).

Domestic credit to the private sector, as a share of GDP, started to weaken in 1992 (see Figure 3.2). The lowering of maturities restricted eligible securities, as collateral for overnight loans such as treasury bills and bonds. Treasury bills maturity halved; while the Treasury bonds terms were reduced to 45 days or less (Ngugi, 2001).

The cash ratio was re-activated in 1993 and sequentially increased to 20% in March 1994 to mop up the excess liquidity including the wave foreign exchange surge inflows. Commercial banks and NBFIs that failed to meet the cash ratio requirements were subjected to penalties (Ngugi, 2001).

These measures supported by the tight fiscal policy adopted (budget rationalization attempts) in 1994 were only effective to reduce money supply but not sufficient to curb inflation, as inflation was largely caused by the drought and the 1992/93 election bound fiscal deficits (Kinyua, 2001). Economic performance between 1992 and 1994 remained gloomy. Real interest rates were negative despite the nominal interest rates being high, and fiscal deficits worsened as result of expansionary fiscal policy and inflation rose to 30% (Kinyua, 2001).

Prior to 1996, monetary policy had multiple objectives, which were often inconsistent with the sustenance of low and stable inflation. Thereafter, the CBK Act was amended, clearly defining the narrowed mandate of the monetary policy as well empowering the central bank with more autonomy. Prior to 1996, the Minister for Finance had exclusive authority over CBK Board of Directors and could overrule monetary policy without restraint. Price stability was defined as the primary objective with the ultimate aim of promoting the long-term goal of economic growth. The other objectives included: promotion of liquidity, exchange rate stability and ensuring financial stability (Kinyua, 2001). The Minister of Finance was mandated to provide six months Monetary Policy Committee (MPC) reports to Parliament; detailing the monetary policy performance, future annual targets and annual policy strategy (Kinyua, 2001).

The amendment of the act also mandated CBK to shift from targeting broad money (M3) to targeting broader money (M3X and MXT)⁴ as the intermediate target; and the

⁴ M3 is defined as currency in circulation, term, and non-term domestic deposits held with banks and NBFIs. M3X as M3 plus foreign currency deposits (FCDs) held by residents, whereas M3XT is

actual transition to broader aggregates happened in 1998. In addition, the reserve money consisting of currency in circulation and bank reserves kept at CBK served as an operating target (Kinyua, 2001). The Open Market Operations (OMO), cash ratio and reserve requirement, rediscount facilities and lender of last resort facility were used as monetary instruments (Kinyua, 2001).

The *dejure* monetary targeting remained in place until 2011. Faced with the inflation spiral in 2011, CBK in September that year moved to adopt the short-term interest rates as the main operational target, while maintaining the monetary targeting framework (Andre *et al.*, 2013). The current monetary framework is regarded as flexible monetary targeting, which targets both the quantity (reserve money) and prices (interest rates), with the primary objective of attaining the inflation targets while the secondary objective is to support economic growth and employment creation as well as financial stability (CBK, 2010). The quantities are targeted through targeting the reserve money, where its targets serve as the operational target, while targeting prices by using the Central Bank Rate (CBR) to signal the monetary policy stance (Andrle *et al.*, 2013).

The Central Bank Rate (CBR) is used as a reference rate for pricing monetary policy operations. It is set and announced monthly by CBK's monetary policy committee. The CBR serves as a reference for interbank rates and repo rates. Previously it served as reference for interest rate for CBK overnight lending facility. A number of other monetary instruments including: the open market operations (OMO), standing facilities (as a lender of the last resort), required reserves, foreign market operations, licensing and supervision of commercial banks and communication of bank decisions are used to achieve the monetary stance (Berg *et al.*, 2013). Table 3.4 shows the monetary policy and exchange rate regime in Kenya.

Table 3.4: Monetary Policy Framework and Exchange Rate Regime in Kenya

Monetary Policy Framework	Monetary Policy Mandate	Monetary Policy Instruments	Exchange Rate Arrangement
Flexible monetary targeting	Price stability, exchange rate stability, financial stability and support of government policy	Open market operations, Repo operations, foreign exchange intervention, rediscount policy, reserve requirements, policy rate, moral suasion	Free floating

Source: Authors computations based on data from CBK (2013a); IMF (2014)

A number of other monetary instruments shown in Table 3.4 including the open market operations (OMO), standing facilities (as a lender of the last resort), required reserves, foreign market operations, licensing and supervision of commercial banks and communication of bank decisions are used to achieve the monetary stance (Berg *et al.*, 2013).

A monetary policy unit was subsequently set up at the central bank to provide monetary policy analysis and forecasting support to the MPC and projections and this framework was operationalised in September 2013 (IMF, 2013c).

The new Kenyan Constitution of 2010 also reinforced the independence of the central bank provided for in CBK Act. The Act was itself amended in 2012 to provide enhanced transparency of its operations. The central bank is expected to carry out its mandate without any political interference (IMF, 2013c). The appointment of the CBK governor and the deputy remain an exclusive mandate of the President. However, that is subject to approval by Parliament (IMF, 2013c).

In November 2013, Kenya signed the East African Monetary Union Protocol. All the partner States were expected to conclude the ratification of the Protocol by July 2014. A monetary affairs committee is currently in place – with the aim of harmonising both monetary and exchange rate policies in line the agreed macro-economic convergence criteria. Performance convergence criteria, which include a

headline-inflation target of maximum 8%, a fiscal deficit, including grants as a percentage of GDP of 3%, present value of public debt, as a percent of GDP of utmost 50%, and a foreign-exchange reserve cover of at least 4.5 months of import value (CBK, 2013a). From 2024 onwards, a single currency was mandated to be adopted, provided at least three partner states met the performance target for at least three consecutive years (CBK, 2013a). Table 3.5 shows the Kenyan economy performance against the EAC monetary union convergence criteria in 2013.

Table 3.5: Kenya's Performance against the EAMU Convergence Criteria

	Macro-Economic Convergence Criteria	Kenya Performance Status June 2013
Headline Inflation (%)	< 8	4.6
Fiscal Deficit as % of GDP(including grants)	< 3	6.8
Present value of public debt as %of GDP	≤ 50	40*
Reserve Cover (months of imports)	> 4.5	4.4

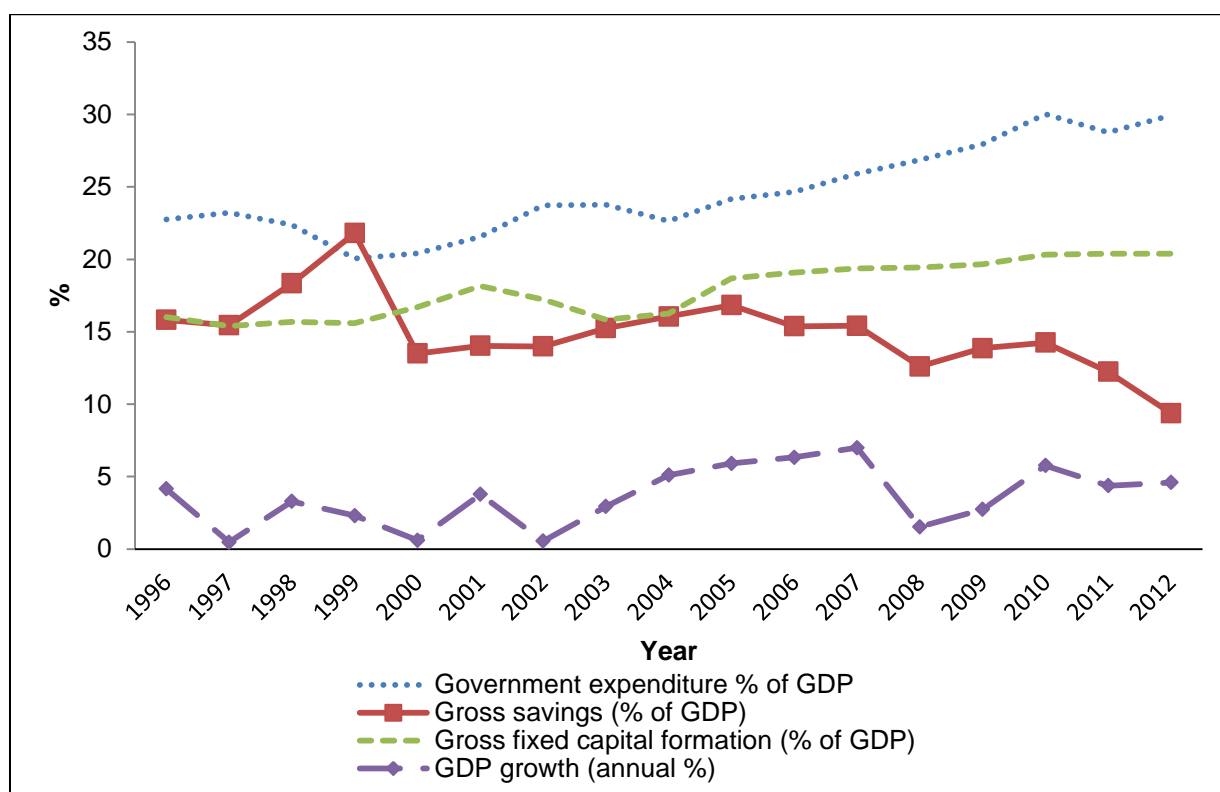
Source: Authors computations based on data from CBK, (2013a); IMF, (2013c)

* IMF estimate reported in debt sustainability analysis 2013.

Table 3.5 shows that fiscal deficit as share of GDP is above the EAC monetary union convergence threshold. The un-harmonised fiscal policies especially in regard with the agreed macro-economic convergence criteria will weaken the monetary union effectiveness. The convergence criteria aim to ensure that the countries have fairly the same economic structure (Morales, 2012).

The Council of Ministers is still expected to implement a 10-year roadmap, based on a single currency (CBK, 2013a). Figure 3.3 presents selected economic indicators for Kenya (1996-2012).

Figure 3.3: Selected Economic Indicators for Kenya (1996-2012)



Source: Authors computations based on data from World Bank (2014)

Figure 3.3 shows that since the mid-1990s, the Kenyan economy has experienced mixed economic performance. The economy grew at moderate rates, and this was largely supported by stable significant levels of gross savings, government growing expenditure, and investments. In addition, Figure 3.3 shows government expenditure as share of budget increased from 23% in 1996 to 29% in 2012, gross fixed capital formation as share of GDP increased by 4 percentage points, and while gross savings a share of GDP dwindled by 6% over the same period implying that the savings investment gap widened.

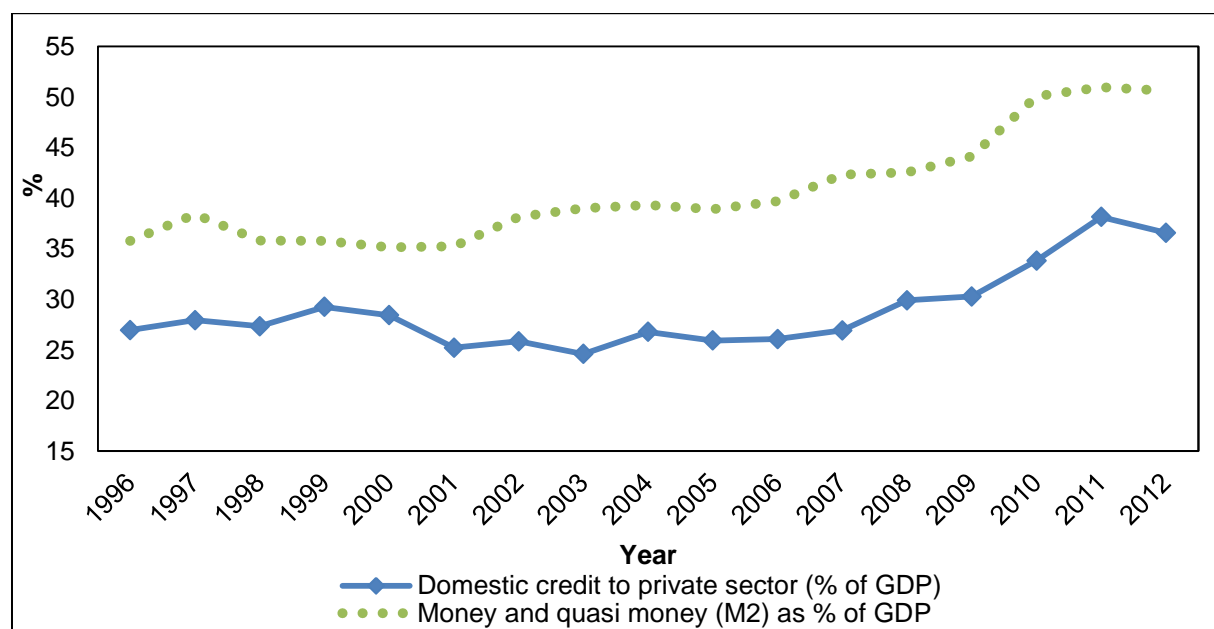
Table 3.6 presents Kenya's real GDP annual performance relative to the regional and sub-Saharan African counterparts.

Table 3.6: Real GDP for Kenya against Regional Selected Countries

Country	1996-2005	2006	2007	2008	2009	2010	2011	2012	2013	1996-2013
Burundi	0.9	5.4	3.4	4.9	3.8	5.1	4.2	4.0	4.5	4.0
Kenya	2.9	6.3	7.0	1.5	2.7	5.8	4.4	4.6	5.6	4.5
Uganda	7.0	7.0	8.1	10.4	4.1	6.2	6.2	2.8	6.0	6.4
Rwanda	8.7	9.2	7.6	11.2	6.2	7.2	8.2	8.0	5.0	7.9
Tanzania	5.5	6.7	7.1	7.4	6.0	7.0	6.4	6.9	7.0	6.7
Sub-Saharan Africa	4.7	6.3	7.1	5.7	2.6	5.6	5.5	4.9	4.9	5.3

Source: Authors computations based on data from IMF (2014a)

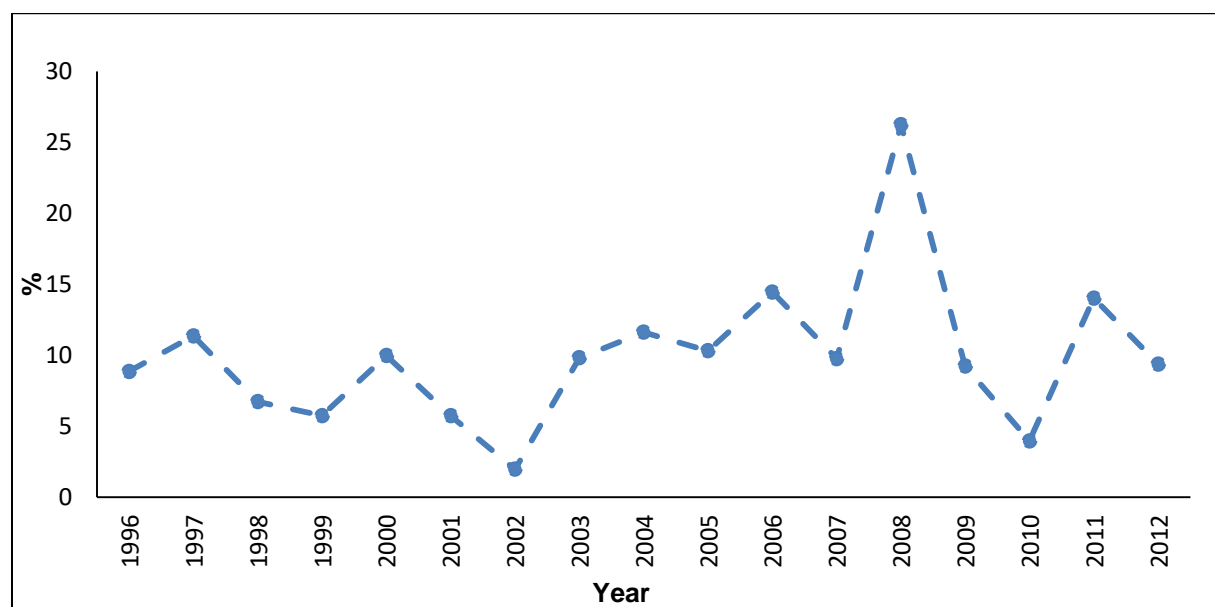
Despite the Kenyan economy remaining the biggest economy in the EAC region, its growth shown in Table 3.6 has been inferior to the sub-Saharan average, and EAC countries with the exception of Burundi (IMF, 2014a). Figure 3.4 presents selected financial depth indicators for Kenya (1996- 2012).

Figure 3.4: Selected Financial Depth Indicators (1996- 2012) for Kenya

Source: Authors computations based on data from World Bank, (2014)

Figure 3.4 illustrates that the Kenyan economy has also, since mid-1990s, enjoyed tremendous levels of financial developments: domestic credit to private sector as share of GDP increased from 27% in 1996 to almost 37% in 2012, and M2 as share of GDP increased by 15% over the same period to 50% of GDP. The Kenya inflation trend for the period from 1996 to 2012 is presented in Figure 3.5.

Figure 3.5: Inflation Trend for Kenya (1996-2012)



Source: Authors computations based on data from World Bank (2013)

The increase in private sector credit and money supply, illustrated in Figure 3.4, was associated with modest levels of inflation, and in particular inflation, as shown in Figure 3.5, was below the CBK medium target of 5%, that is, only twice over that period. The economy has in the recent past been susceptible to the global economic shocks; in particular, two global episodes of increases in global food and energy prices. The first was in 2007/08, coinciding with the global financial crisis, and the second was in the 2010/11, characterised by food and energy prices soaring (Berg *et al.*, 2013).

Kenya, just like many LICs, has encountered dominant supply shocks over the demand shocks. The supply shocks tend to increase the likely conflict between output and inflation. In regimes of inflation targeting, lower inflation will occur at the

cost of output especially when the supply shocks are dominant (Adam *et al.*, 2010a). Table 3.7 presents the interest rate structure for Kenya from 1993 to 2012.

Table 3.7: Interest Rate Structure for Kenya (1993-2012)

Year	Savings Deposit Rate (%)	Lending Rate	Interbank Rate	91-day Treasury bill Rate	Interest Rate Spread (Lending Rate Minus Deposit Rate, %)
1993	18.6	24.99	54.92	55.70	6.34
1994	19.41	26.04	66.27	57.01	6.63
1995	19.96	27.08	60.16	57.51	7.12
1996	20.42	27.99	34.83	57.72	7.57
1997	20.69	28.95	36.21	56.48	8.25
1998	20.88	29.51	35.52	53.41	8.63
1999	20.89	30.09	25.90	49.09	9.20
2000	20.75	30.65	22.72	44.51	9.91
2001	20.26	31.14	21.69	39.89	10.88
2002	19.74	31.50	24.79	35.04	11.76
2003	19.08	31.43	15.71	30.54	12.35
2004	18.29	31.02	16.48	27.37	12.73
2005	17.52	30.55	14.67	25.20	13.03
2006	16.60	29.97	10.38	23.80	13.37
2007	15.87	29.30	9.86	23.28	13.43
2008	15.14	28.71	6.89	22.38	13.57
2009	14.49	27.96	13.05	21.08	13.47
2010	13.83	27.30	8.90	19.73	13.47
2011	13.22	26.62	10.50	18.40	13.40
2012	12.69	25.86	12.44	17.46	13.16

Source: Authors computations based on data from CBK (2013a)

The liberalisation of interest rates and resultant increased financial deepening, as shown in Figure 3.4, did not translate into lower the interest or its spread. Table 3.7

shows that the spread instead increased to double-digit figures. This reflects largely the increase in lending rates and a reduction in savings deposit rates.

The high Treasury bill rates eased to lower than the lending rate from 2003 onwards and to lower than half the 1993 rate of 55.7% (CBK, 2013a). The latter is partly because of the reinforced central bank independence in 1996, and the limited use of T-bills for fiscal operations (CBK, 2013a).

The perseverance of high interest rates largely reflects inefficiencies in the financial markets and is in part, explained by the consistent bank structural inefficiencies, limited competition, poor institutional environment quality, internal political and geo political uncertainties, and fiscal- monetary operations (Adam *et al.*, 2010a). These include but are not limited to: security of property rights, quality and enforcement of its accounting, disclosure standards, bankruptcy laws and asymmetric information on the domestic borrowers.

3.4 Financial and Economic Structure of Kenya

The effectiveness of monetary policy instruments depends on the strength and reliability of the monetary transmission mechanisms. The channels through which monetary policy affects aggregate demand depend on a country's economic and financial structure (Mishra *et al.*, 2010).

Kenya is nearly a middle income with its GDP per capita at USD 930 in 2013, slightly above the LIC average of USD 663.9 but below the sub-Saharan average of USD 1624 (World Bank, 2013). The economic structure is largely consistent with the LIC structure; with low trade shares dominated by commodity exports, a large agricultural sector, small share of high technology exports as a share of total manufactured exports and falling aid (Berg *et al.*, 2013). Table 3.8 shows the economic structure indicators for Kenya versus the selected group of comparators.

Table 3.8: Selected Economic Structure Indicators for Kenya versus Select Comparators

	Exports (% of GDP)	Imports (% of GDP)	Commodity Exports (% of Total Exports)	High Tech Exports (% of Total Manufactured Exports)	Official Development Assistance (% of GDP)
Kenya	27.60	45.0	60.9	5.7	6.6
SSA	31.9	39.5	-	4.3	3.2
LIC	23.2	33.7	64.0	-	7.4
HIC	-	-	19.5	17.4	0

Source: Authors computations based on data from World Bank (2013)

Table 3.8 shows that Kenya remains a low-income country, with high commodity exports as share of total exports in tandem with the LIC average. The levels of official development assistance (ODA) equally remain high.

As already shown in Figure 3.4, Kenya has enjoyed significant levels of financial deepening – which has in part contributed to its fairly large financial sector relative to the EAC region. Kenya became the second largest African investor in other sub-Saharan African countries, in particular with its banks increasing operations in other African countries (IMF 2013). Table 3.9 shows selected financial development indicators for Kenya and selected SSA countries.

Table 3.9: Financial Sector Indicators for selected SSA countries

	Bank Credit to Private Sector (% of GDP)	Market Capitalisation of Listed Companies (% to GDP)	Stocks Traded, Total Value (% of GDP)
Kenya	36.9	36.7	2.5
Low Income Countries	18.0	20.8*	4.9*
Sub-Saharan	-	68.2	29.8
High Income Countries	133.7	86.4	82.7

Source: Authors computations based on data from World Bank,(2012).

* 2011 figures

While Kenya has enjoyed an impressive degree of financial development and has the largest financial markets in EAC, its financial development indicators, shown in Table 3.9, suggest that financial markets remain relatively underdeveloped in comparison with those of the sub-Saharan Africa and the high income countries (HICs).

Significant banking sector growth has been recorded over the last two decades, with the total banking deposits as a share of GDP growing to from 27% in 1996 to 33% in 2012 (Nyamwogo and Ndirangu, 2013). By the end of 2013, the Kenyan financial system comprised 43 commercial banks, one mortgage finance company, nine representative offices of foreign banks, nine deposit-taking micro-finance institutions, 112 foreign-exchange bureaux, and two credit reference bureaux (CBK, 2013b).

According to the 2013 Kenya Institute for Public Policy Research and Analysis (KIPPRA) report, the insurance sector included 154 insurance brokers, 23 medical insurance providers and 4,205 insurance agents. The commercial banking sector continues to denominate the financial sector. As at end 2012, the assets of the pension sector, micro finance banks, and insurance sector accounted for just 38% of the total commercial banking sector (KIPPRA, 2013).

Kenya's banking sector remains solid; in particular, the commercial banks remain well-capitalised above the minimum regulatory capital adequacy requirement, and well-buffered to withstand any shocks (CBK, 2013c).

Table 3.10 shows the bank soundness indicators for Kenya.

Table 3.10: Banking Sector Financial Soundness for Kenya

	Dec-12	Jun.13
	(%)	
Capital adequacy		
Regulatory capital risk-weighted assets	21.9	23.3
Regulatory tier 1 capital to risk-weighted assets	18.9	20.5
Total capital to total gross assets	16.3	17.1
Asset quality		
Non-performing loans to total gross loans	4.5	5.3
Non-performing loans net of provision to capital	3.5	6.2
Earning assets to total assets	87.4	88.7
Earning and profitability		
Return on assets (ROA)	3.8	3.9
Return on equity (ROE)	34.2	31.2
Interest margin to gross income	32.7	36.6
Non-interest expenses to gross income	37.8	40.7
Liquidity		
Liquid assets to total assets	35.2	35.3
Liquid assets to short-term liabilities	41.9	42.7
Liquid assets to total deposits	46.8	47.5
Total loans to total deposit	76.9	77.8
Sensitivity to market risk		
Net open position in foreign exchange to capital	2.6	2.7
Interest bearing assets to interest bearing liabilities	116.2	119.3
FX currency denominated assets to total assets	13.2	12.1
FX currency denominated liabilities to total liabilities	20.9	21.3
Spread between lending and deposit rate	10.3	9.4

Source: Authors computations based on data from CBK (2013)

Table 3.10 shows that overall the banks remained liquid, with sound profitability, as shown by the return to assets. In the year to June 2013, the regulatory tier 1 capital to risk-weighted assets increased to 23 % from 21.9% in the previous year; while the ratio of total regulatory capital to risk-weighted assets rose from 20.7% to 24.3%. The total capital to total gross assets portrayed in Table 3.10 increased to 17.1% from 16.3% over the corresponding period (CBK, 2013c). The asset quality, however, registered a decline, primarily because of an increase in the non-performing loans, as a share of the total assets, increasing by 0.8% to 5.3% in June 2013 (CBK, 2013c).

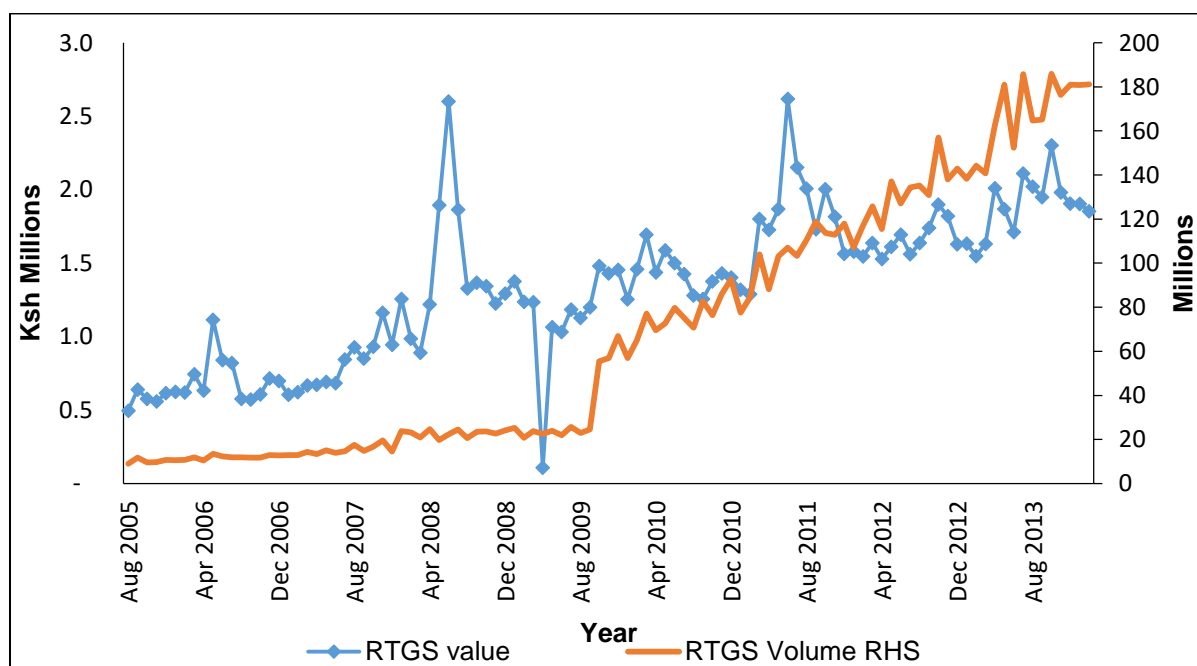
The Kenyan formal banking system, however, is dominated by a few banks, with the largest 6 banks accounting for 51.4% of the commercial bank's assets, 50.2% of the customer deposits, and 61.8% of the pre-tax profits; and it had a market share of 52.39% (CBK, 2013). This in part could weaken the bank lending and interest channel because the monetary policy actions may not be fully transmitted to changes in the credit availability, loan rates and deposit rates (Mishra *et al.*, 2012).

Despite the continued oligopolistic nature of banking sector, the competition from the non-bank institutions and the growing network of banking industry has spurred sensational growth of financial innovation, in particular with mobile technology and new financial instruments and services. The growth in mobile money services has been exponential since its launch in March 2007, with the number of transactions growing to about 65 million in August 2013 and the value increased to about Ksh 160bn (Nyamwogo and Ndirangu, 2013). The number of adults at 11.5 million using mobile phone financial services is more than double the 5.4 million that use banks (Financial Sector Deepening Kenya and CBK, 2013).

The ATMs that were introduced in late 1990s increased to more than the number of commercial bank branches by 2006, at 540 ATMs and thereafter grew at even a faster rate to 2487 in December 2013 (CBK, 2013b). Agency banking launched in 2010 has also seen tremendous growth. The number of contracted agents had grown to 19,649 agents and facilitated over 58.6 million transactions worth Ksh 310.5 billion in December 2013 (CBK, 2013b).

Figure 3.6 also shows the real-time gross settlement systems (RTGS) by volume and value of transactions in Kenya from 2005 to 2014.

Figure 3.6: RTGS for Kenya (2005-2014)



Source: Authors computations based on data from CBK (2013)

Figure 3.6 shows that Kenya has endured a steep growth in mobile money, both by volume and value of transactions, since its introduction in 2005. Table 3.11 shows Kenya financial access indicators for 2006, 2009 and 2013.

Table 3.11: Financial Access for Kenya (2006 -2013)

	2006	2009	2013
Formal prudential	15	22	33
Formal Non prudential	9	31	63
Formal registered	15	12	7
Informal	47	51	37
Excluded	39	31	25

Source: Authors computations based on data from Financial Sector Deepening Kenya and CBK (2013).

The growth in financial innovations and in the banking sector was associated with increased financial access over the years. According to Fin Access Survey by Financial Sector Deepening Kenya and CBK (2013), Kenya's financial access also shown in Table 3.11, has evolved since 2006 with the proportion excluded from financial access reducing from 39% in 2006 to 25% in 2013. In addition, Kenya's financial access is the highest in the EAC region.

Table 3.12 shows Kenya's financial access indicators versus the EAC regional financial access indicators.

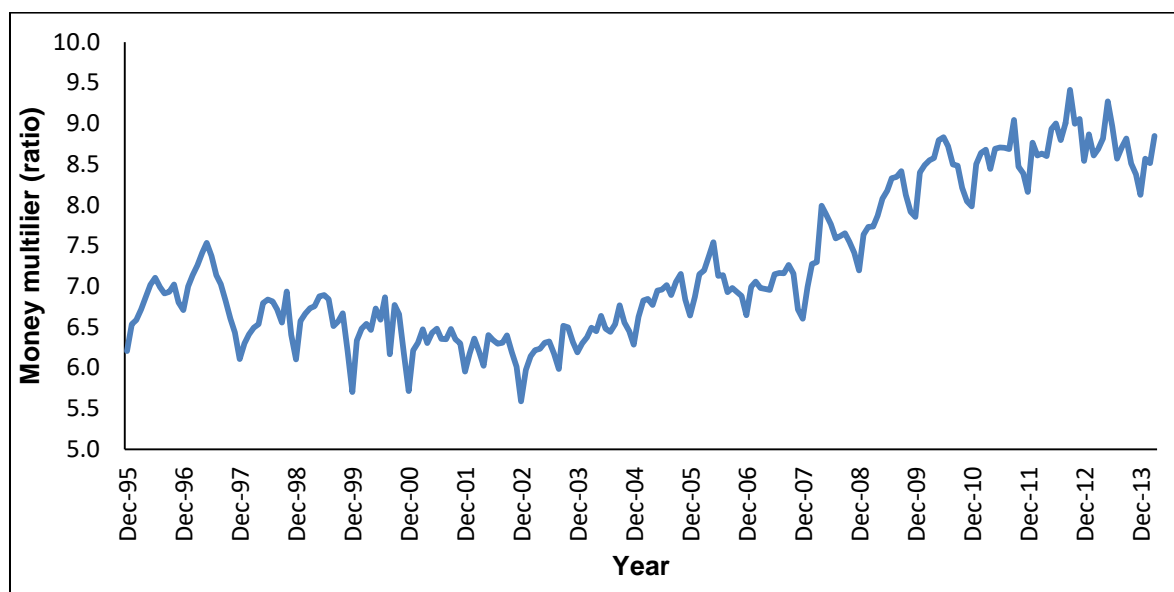
Table 3.12: Kenya's Financial Access versus EAC Countries

Country	Formal	Informal	Excluded
Kenya 2013	67	8	25
Uganda 2013	39.4	30.6	30
Burundi 2012	13	14	73
Tanzania 2009	16	27	57
Rwanda 2012	42	30	28

Source: Authors computations based on data from Financial Sector Deepening Kenya and CBK (2013).

Kenya's financial access, as shown in Table 3.12, is the highest in EAC region. The presence of a stable money demand function enhances the ability of monetary authorities to reach predetermined monetary growth targets if price stability is the main objective (Sichei and Kamau, 2012). Figure 3.7 shows the money multiplier ($M3/\text{Base Money}$) for Kenya for period 1995 to 2013.

Figure 3.7: Money Multiplier for Kenya (1995-2013)



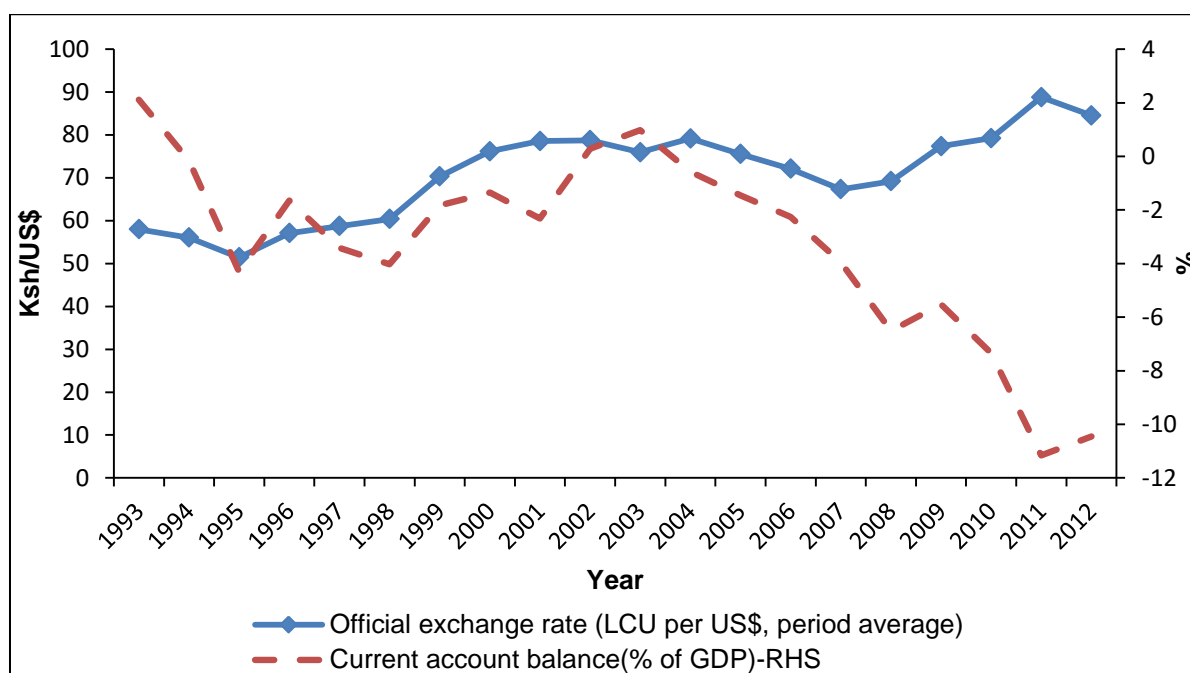
Source: Authors computations based on data from CBK, (2014)

Figure 3.7 shows that money multiplier ($M3/RM$) has risen over the years and has been volatile. The impressive financial innovations, however, tend to make the conduct of monetary policy complex by increasing the volatility money multiplier and consequently the instability of money demand (Nyamwongo and Ndirangu, 2013).

3.4.1 Exchange Rate Regime and Capital Account of Kenya

The IMF classifies the exchange rate arrangement of Kenya as free floating, and CBK intervenes in foreign exchange market, through auctions or through direct interventions in the dealing system, under which the market is informed but amounts and rates are not published (IMF, 2013b). The average rate through auctioning is however, published after the auction closes (Berg *et al.*, 2013). Figure 3.8 shows the trend of the exchange rate (Kenya shilling against the US dollar) and Current Account for Kenya for period from 1993 to 2012.

Figure 3.8: Exchange Rate and Current Account for Kenya (1993 -2012)



Source: Authors computations based on data from World Bank (2013) and IMF (2014).

Figure 3.8 shows that the exchange rate was volatile, with the Kenyan shilling depreciating against the US dollar since 1993 until 2003/04. The shilling appreciated thereafter until 2007 when it again depreciating reaching the 2004 level again in 2010, and worsening further in 2011. The depreciation, especially from 2007, coincided with a growing current account deficit. The current account deficit reached 11% in 2011 corresponding to the most depreciation of the shilling in two decades (IMF, 2014a).

The capital account of the balance of payments has remained open with no quantitative capital controls since its liberalisation in the mid-1990s (O'Connell et al., 2010). Chinn and Ito (2008) created an index that measures the extent of openness in capital account transactions, a higher value of which corresponds to fewer restrictions in international transactions.

According to *de jure* index by Chinn and Ito (2008), using the updated financial index values of 2011, Kenya scores 1.0. The index takes a maximum value of 2.5 for the most financially open economies, and a minimum of -1.9 for the least financially open. The Chinn-Ito index, *de jure* openness index of capital and financial accounts, concur that Kenya along with Uganda are more financially integrated than their other EAC counterparts (Chinn and Ito, 2015).

The openness of the capital account has attracted significant participation of foreigners on the domestic market. In 2012, the foreign investors accounted for 50% of turnover at the Nairobi Stock Exchange (NSE) and the total net equity foreign portfolio inflow during the financial year 2012/2013 was Kshs23.7 billion, the highest in the history of the NSE. This in part explains the growth in capital account surplus, accounting for 11.60 percent of GDP in fiscal year 2011/12 (CBK, 2013a). Table 3.13 shows the FDI flows to EAC in US\$ Millions, for the period from 2006 to 2012.

Table 3.13: FDI Flows to EAC (US\$ Millions)

	2006	2007	2008	2009	2010	2011	2012
Uganda	644	792	729	842	544	792	1720
Kenya	51	729	96	116	178	335	259
TZ	403	582	1247	953	1023	1095	1710
Rwanda	31	82	103	119	42	106	160
Burundi	0	1	4	0	1	2	1

Source: Authors computations based on data from UNCTAD (2013)

Table 3.13 shows that Kenya has not attracted as much FDIs as Uganda and Tanzania. In 2012, both Uganda and Tanzania received FDI flows more than six-fold the FDI flows to Kenya (UNCTAD, 2013).

3.5 Challenges Facing Monetary Policy Effectiveness in Kenya

Monetary Policy conduct in any country is a daunting task as it encompasses a wide stream of complexities ranging from understanding the transmission mechanisms, employing different monetary instruments to achieve multiple objectives (at times competing objectives like growth and exchange rate stability) while exercising its monetary policy authority independently from the other authorities (Mishra *et al.*, 2012). The challenges for the conduct of monetary policy are wide ranging in nature, *inter alia* institutional, political, structural, and technical challenges (Hammond *et al.*, 2009).

One of the gravest impediments in the conduct of monetary policy is the lack of exclusive independence of the central bank in exercising monetary policy mandate amongst its other oversight roles. The lack of independence weakens the impact of monetary policy in influencing private sector expectations. The transmission from short-term interest rates to longer-term rates depends on agents' interpretation of what an unanticipated change in monetary policy indicates about future monetary policy (Mishra *et al.*, 2012).

Dincer and Eichengreen (2014) developed two new measures of central bank independence – the Central Bank Independence Unweighted (CBIU) and the Central Bank Independence Weighted (CBIW).

Table 3.14 shows the CBIW scores for Kenya from 2005 to 2010.

Table 3.14: Central Bank Independence Index Weighted (CBIW) for Kenya versus Other Regional Comparators

	2005	2006	2007	2008	2009	2010
Kenya	0.67	0.67	0.67	0.67	0.67	0.67
Uganda	0.28	0.28	0.28	0.28	0.28	0.28
Tanzania	0.46	0.56	0.56	0.56	0.56	0.56
Africa	0.31	0.33	0.34	0.36	0.35	0.34
Europe	0.71	0.71	0.71	0.71	0.72	0.72
Asia	0.36	0.37	0.37	0.38	0.38	0.38
Northern America	0.2	0.2	0.2	0.2	0.2	0.2

Survey included 17 African, 2 North America (USA and Canada), and 28 Asian countries

Source Authors computations based on data from Dincer and Eichengreen, 2014.

From the CBIW results reported in Table 3.14, Kenya exhibited relative central banks independence to its regional counterparts. Compared with other regions, Kenya scores significantly in the range of Europe, which has the most independent central banks according to this measure. In addition, while CBK independence is enshrined

in the constitution and the revised CBK Act, sometimes central decisions are superseded, if they are deemed inconsistent with their objectives (Berg *et al.*, 2013).

CBK Act accords the Central Bank a number of roles (Berg *et al.*, 2013). Pursuance of the multiple objectives, the CBK operates a hybrid regime of using both the policy rates and monetary targeting, in addition to using several instruments. By aiming to achieve low inflation and sound economic growth, inevitably and indirectly any country will respond to the exchange rate movements even in cases of free-floating regime (Cheng, 2006).

While price stability remains the primary mandate, the concerns about path and volatility of exchange rate continue to play a dominant role (Adam *et al.*, 2010a). This will likely pose the impossible trinity/trilemma of controlling inflation, supporting government policy, and maintaining a stable favourable exchange rate in Kenya. Maintaining a stable exchange rate can compromise the flexibility the central bank has in using policy instruments such as the interest rate to pursue an independent domestic monetary policy aimed at managing domestic activity and inflation (Goodfriend, 2004). In addition, in small economies like Kenya that are susceptible to supply side shocks, managing the trade-off objectives between inflation and output is a daunting task (Adam *et al.*, 2010a). Unfortunately, the vast majority of governments of sub-Saharan African countries, Kenya included, lack the instruments to make monetary policy effective (Weeks, 2010).

The impossible trinity tends to be exacerbated by the openness of the capital accounts. This tends to increase the cross boarder trades in reaction to cross border premium differentials and makes it difficult to quarantine monetary policy from external forces. An open account tends to increase the volatility of exchange rate-foreign inflows increase the appreciation of the domestic currency. This often lures the central bank into foreign exchange intervention and the need to restore monetary autonomy through bond sterilisation only drives the domestic interest rates further up, creating a risk of further appreciation of the currency (Prasad and Rajan, 2008). The monetary policy forecasting must evolve more rapidly with openness of trade and capital accounts, rendering the past a weak indicator of the future (Adam *et al.*, 2010a). Empirical studies indicate that even in economies with capital restrictions,

capital flows remain largely driven by incentives around the globe or in part explained by large loopholes to get around these controls (Hammond *et al.*, 2009).

The discovery of natural resources (oil in Kenya's case) however tends to increase the capital flows; and Kenya FDI inflows are projected to increase to more than threefold of the current inflows annually (CBK, 2013). There is also a growing trend in the share of foreign investor's activity on the NSE, accounting for 50% of the turnover. On the other hand, capital inflows are often associated with asset prices booms, especially in underdeveloped financial markets. At the same time, portfolio investments tend to be volatile, especially when there are incentives for cross-border investments. Some empirical studies advise against greater openness of the capital account; and they propose moderate tax on capital flows (Prasad and Rajan, 2008).

Kenya maintains both monetary and interest rate as operational targets, which makes it often intricate to understand the transmission mechanism of each policy instrument, or at least to know how to interpret any particular interest rate. Further, the requisite core analytical capacity and the models in inflation forecasting in Kenya are only being built (Adam *et al.*, 2010a). Effective communication in a largely informal and rural economy like in Kenya is a daunting task, and this is likely to lead to a time inconsistent behaviour. Sometimes when policy rates are not market clearing, it presents no arbitrage opportunities with other short-term interest rates, and contain no signal of policy intention (Berg *et al.*, 2013).

The transition to full policy rate targeting for the purpose of influencing the private sector's expected inflation will not only pose technical and institutional challenges but CBK will be faced with the challenge of ensuring that interest rates including the spread are competitively low (Adam *et al.*, 2010a). The high interest rates are in part a reflection of the size and structure of the financial sector. Kenya's financial sector is fairly small and underdeveloped in relation to the developed economies. In particular, despite the financial markets having enjoyed a fair degree of improvement over the last couple of years as shown by the all securities share index, they remain small comparing unfavourably with the developed economies (Berg *et al.*, 2013).

The small size of the formal financial sector implies that monetary policy actions on aggregate demand will likely be weak because much of the economy does not

interact with the formal financial sector (Mishra *et al.*, 2012). Empirical studies indicate that the efficacy of monetary policy is contingent upon the development and size of the formal financial sector; and that the developed financial markets tend to significantly explain a more efficient monetary policy implementation (Krause and Rioja, 2006; Mishra *et al.*, 2010).

As aforementioned, the Kenyan financial sector is mainly dominated by the commercial banking sector. While the country has a fairly developed banking sector, a few banks enjoy the largest share of the total commercial bank assets and profits. This in part weakens the bank lending and interest channel because the monetary policy actions may not be fully transmitted to changes in the credit availability, loan rates and deposit rates (Mishra *et al.*, 2010). In addition, the level of financial intermediation is still low and access to financial services remains limited (Berg *et al.*, 2013). According to the Fin Survey Report (Financial Sector Deepening Kenya and CBK, 2013), a quarter of Kenya's population are excluded.

There are also substantial amounts of foreign denominated deposits in the banks, and this increases the risk of volatility of the exchange rate due to cross boarder investment incentives. The foreign currency deposits as share of total deposit (dollarisation) have more than tripled from 6% in 1995 to 18% in December 2013 (CBK, 2013c). The foreign deposits and the excess reserves tend to be invested in government securities as opposed to the private sector, ultimately weakening the bank credit-lending channel (Saxegaard, 2006).

Empirically, it has been found that dollarisation is likely to promote financial deepening only in a high inflation environment; and financial instability is likely higher in dollarized economies (De Nicoló *et al.*, 2003). Also Table 3.10 shows that in the year to June 2013, the banks' foreign currency assets as a share of their total assets remain above 10% and the foreign currency denominated liabilities to total liabilities increased to 21.3%, from 20.9% in the previous year.

The size of financial sector and the high interest rates is also in part attributed to the poor institutional and regulatory environment (Mishra *et al.*, 2010). The institutional environment relates but is not limited to: the political state; functioning of legal system, accounting and disclosure standards, property rights and their enforcement,

government financial accountability and the policy regulatory environment. Empirical studies have used the World Bank governance indicators as proxies for the institutional environment (Mishra *et al.*, 2012; Montiel, 2013). Table 3.15 shows the world governance indicators for Kenya for the period from 2007 to 2012.

Table 3.15: World Governance Indicators for Kenya (2007-2012)

Governance Indicator	2007	2008	2009	2010	2011	2012
Control of Corruption: Percentile Rank	18.93	13.11	11.96	18.57	18.48	12.44
Government Effectiveness: Percentile Rank	36.41	34.47	33.01	36.36	35.55	35.41
Political Stability and Absence of Violence/Terrorism: Percentile Rank	11.06	10.53	9.48	13.21	12.74	10.43
Regulatory Quality: Percentile Rank	47.57	47.57	48.33	50.24	45.50	41.63
Rule of Law: Percentile Rank	17.22	15.87	16.11	17.06	17.37	22.27
Voice and Accountability: Percentile Rank	39.42	39.42	35.55	39.81	39.44	39.34

Source: Authors computations based on data from World Bank (2013)

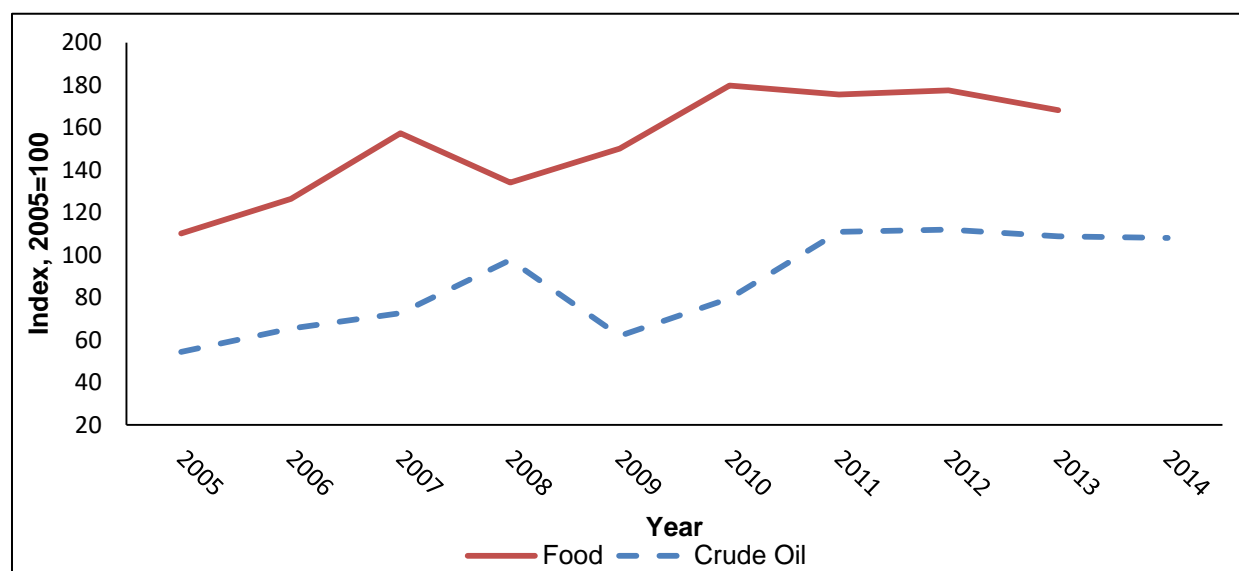
Table 3.15 shows that Kenya scores low on the control of corruption, political stability and absence of terrorism as well as on the rule of law. This in part implies no or limited enforcement of the laws. The Kenyan scores are consistent with LICs score and significantly lower than both advanced and emerging economies. The poor institutional and regulatory environment has far-reaching effects on the entire financial sector, inevitably increasing the financial intermediation costs and limiting the transmission of monetary policy actions (Montiel, 2013).

Kenya, just like many LICs, has encountered dominant supply shocks over the demand shocks (Berg *et al.*, 2013). The supply shocks tend to increase the likely

conflict between output and inflation. In regimes of inflation targeting, lower inflation will occur at the cost of output especially when the supply shocks are dominant. The explicit targeting of inflation often targets the core component of inflation yet large part of the Consumer Price Index (CPI) consumption basket is accounted for by food and energy. In Kenya, the food prices weight in the CPI is 36%, while fuel accounts for 18%, implying that they both account for over 50%. This indicates that core inflation targeting would end up targeting less than half of the overall consumption basket and agents expectations will likely be driven by headline inflation as opposed to core inflation. This is consistent with views by Berg *et al.*, (2013), and it shows that when headline inflation (influenced by food and energy prices) rises, core inflation as well rises with a commensurate trend.

The domestic episodes of food and fuel inflation are in part associated with the recent past global terms of trade shocks, in particular, relating to the food and fuel prices. Figure 3.9 shows the world commodity prices (Index, 2005=100) for fuel and crude oil for the period from 2006 to 2014.

Figure 3.9: World Commodity Prices (Index, 2005=100) for period 2006-2014



Source: Authors computations based on data from IMF (2014)

Figure 3.9 shows surges in food prices in 2007, shortly before the global financial crisis and the oil prices soared in 2008. The second major shock was 2010, and the

food price shock was associated with domestic inflation, as shown in Figure 3.5. Oil remains the most important source of primary energy in the world, accounting for about 33 percent of the total. The two other fossil fuels, coal and natural gas, account for 28 and 23 percent (IMF, 2014c).

Kenya continues to have persistent high Treasury bill rates, which arguably are associated with the fiscal pressure arising from the open market operations – dominated by the sale of government securities. As of June 2013, the securitized debt accounted for 99.1% of the public debt (CBK, 2013). Table 3.16 shows the composition of Kenya's public debt for period 2011 to 2013.

Table 3.16: Kenya Public Debt (2011-2013)

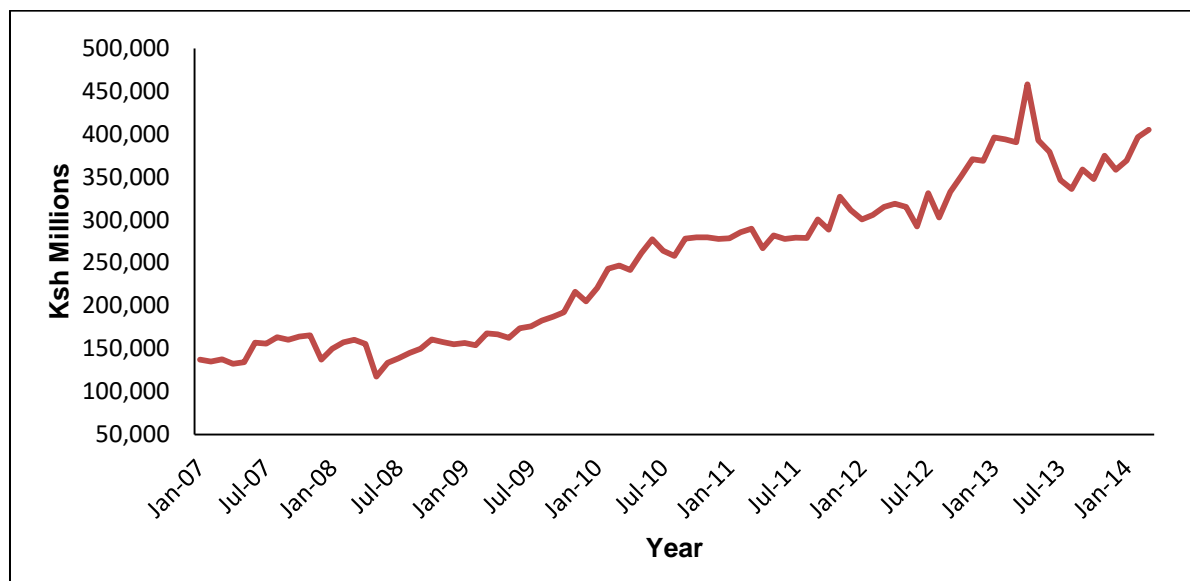
	June 2011	June 2012	June 2013
Total domestic debt (% of GDP)	27.7	26.1	28.7
Total domestic debt (% of total Debt)	51.2	52.9	55.5
Total external debt (% of GDP)	26.3	23.2	23.0
Total external debt (% of total debt)	48.8	47.1	44.5

Source: Authors computations based on data from CBK (2014)

Table 3.16 shows that domestic debt in June 2013, accounted for 55.5% of the total public debt compared to 51% in June 2011. The growth of domestic debt also risks compromising the impact of monetary policy through its impact on interest rates. Increased central bank open market operations, using government debt instruments, can exert powerful real effects through the fiscal burden of interest payments. In most LICs that are dependent heavily on aid and commodity exports, these effects are likely to heighten when the domestic fiscal position is also sensitive to the exchange rate movement (Adam *et al.*, 2010a).

Figure 3.10 shows the net credit to the central government from 2007 to 2014.

Figure 3.10: Net credit to the Central Government for Kenya



Source: Authors computations based on data from CBK (2014).

Figure 3.10 shows that the net credit to central government has over the years, increased but it remains within the IMF programme criteria as of December 2013 (IMF, 2013c).

Developing countries, like Kenya, that have recently discovered oil, tend to be associated with heightened fiscal expansion (Aliyev, 2012). In addition, years to come are likely to be associated with huge portfolio and foreign direct investments as well as increased dollarisation of the economy. All these will likely increase the central need to pay attention to the path and volatility of the exchange rate.

Financial innovations generate shocks to the velocity and money multiplier. In particular, they have been associated with decreases in velocity and increases in money multiplier in Kenya (Davoodi *et al.*, 2013). These financial innovations tend to weaken the transmission of monetary policy through its mitigating impact of the repo rate on output (Misati *et al.*, 2010).

Also the volatility of the multiplier implies that its predictability becomes a challenge at the risk of undermining the reserve money targeting (Nyamwongo and Ndirangu, 2013; Noyer, 2007). Monetary targeting is also challenged by other prediction errors

of output and velocity of money. In particular, prediction of a high negative output gap and higher velocity will tend to over shoot the inflation target, and the reverse is true. However, over-tightening of monetary policy is also likely when there is over-prediction of velocity of money – leading to under-shooting of the inflation target. Prediction of output accurately remains a tall order for an economy undergoing rapid structural transformation (Adam *et al.*, 2010a).

Lessons from EU indicate that the political commitment to a common currency is necessary but not sufficient, as the practical transition is far more intricate. The fiscal policy remains one of the main threats to the conduct of monetary policy and un-harmonised fiscal policies, especially regarding the agreed macro-economic convergence criteria that will weaken the monetary union effectiveness. The convergence criteria aims to ensure that the countries have fairly the same economic structure but EAC member countries remain beyond some of the set thresholds (Morales, 2012).

The above-mentioned challenges are likely to weaken the monetary transmission mechanisms, compromising the effectiveness of the monetary policy in Kenya. However, a recent study on monetary policy in EAC by Berg *et al.* (2013) indicates that when the policy rate is effectively communicated to the financial markets, monetary policy tends to have stronger expected effects.

3.6 Conclusion

Kenya has transformed from direct controls monetary policy to indirect monetary policy using the reserve money as operational target in the early 1990s. The 1990s transitional reforms included, but were not limited to; the liberalisation of the exchange rate and capital accounts; and amendment of the CBK act in 1996 clearly defining the monetary policy mandate. In November 2011, the Central Bank of Kenya (CBK) adopted a new monetary policy framework that gives more prominence to its policy interest rate while retaining monetary policy framework that targets monetary aggregates consistent with the inflation target.

Paradoxically, while monetary policy was largely inactive in the first decade after independence, the Kenyan economy enjoyed the strongest growth levels, low stable inflation and balance of payments surplus. Post 1986 structural adjustment reforms and post liberalisation policies have since yielded modest economic performance and macro stability. This has, in part, led to significant structural and financial developments, in particular, leading to increased innovations in the financial markets and the economy at large. These developments, however, have led to an increase in money multiplier and reduction in velocity – which to some extent has led to instability of the money demand function.

The flexible monetary targeting that uses the CBR as reference rate has produced success, in terms of containing inflation while not suppressing growth. While the elements of fully-fledged inflation targeting are in place, the transition will come in a range of challenges, technical, structural and operational. The financial structure remains underdeveloped; targeting core inflation may be flawed given the structure of the economy, competition within banking sector (the largest sub sector) of the financial sector is dominated by a few banks, and the discovery of commercial oil is likely to heighten the volatility of exchange rate and expansion of the fiscal deficits.

Against that backdrop, monetary policy potency may be compromised if the fiscal policy is overly dominant and not coordinated with Central Bank objectives. Of critical importance, is the observation of a prudent fiscal policy in the wake of the oil discoveries, regarding the control of fiscal deficits and growth of domestic debt.

CHAPTER FOUR

4. MONETARY POLICY AND ECONOMIC PERFORMANCE IN TANZANIA

4.1 Introduction

This chapter gives an overview of Tanzania's economic, monetary and financial reforms – since its independence in 1961 to 2014. In particular, the chapter qualitatively reviews the respective monetary policy frameworks, and the associated economic performance. It also provides an overview of the financial landscape and highlights the challenges to the conduct of monetary policy in Tanzania. The chapter is divided into six sections. Section 4.2 outlines the main features of Tanzania's monetary regime and the associated economic performance between 1961 and 1986. Section 4.3 explores the monetary regime and the associated economic performance from 1986 to 2014. The financial structure is presented in Section 4.4. Section 4.5 highlights the challenges to the effective performance of monetary policy in Tanzania. Finally, Section 4.6 concludes the chapter.

4.2 Monetary Policy Regime and Economic Performance in Tanzania (1961-1986)

Tanzania (then Tanganyika) attained its political independence from the British in 1961. The East Africa Currency Board (EACB), which was set up in 1919, controlled pre-independence monetary policy in Kenya, Uganda and Tanzania and it continued to control money supply in three countries until its demise in 1966. The Tanzania economy post-independence remained market driven, however, with a small financial sector dominated by foreign banks (BoT, 2011). In June 1966, the Bank of Tanzania (BoT), was accorded the mandate of executing the primary roles of the central bank, by the Act of Parliament – the BoT Act 1965 (BoT, 2011). In 1967, the East African Community (EAC) was set up with shared institutions among member countries of Uganda, Kenya and Tanzania (Adar, 2011).

Despite the indirect monetary policy instruments being enshrined in the BoT Act of 1965, they remained non-operational since government then tightly controlled monetary policy activity (BoT, 2011). This was exacerbated by the Arusha declaration⁵ in 1967, which emphasised the state ownership and nationalisation of foreign owned enterprises and production (banks, financial institutions, industries and land) to be controlled by the state (BoT, 2011). All the private banks were nationalised in February 1967, leading to the consolidated bank – National Bank of Commerce (NBC) – fully owned by government, with branches spread nationwide (Nyerere, 1977).

In addition, interest rates from 1967 were administratively fixed throughout the 1970s. For example, the deposit rate was fixed at 3.5% until 1973, where it was marginally raised to 4% until 1978 (Odhiambo, 2011). Also, Odhiambo, (2011) notes that the nominal Treasury bill rate remained fixed at 5% until 1977 when it was adjusted to 6% and maintained until 1986.

Socialist macro-economic policies continued through the 1970s, with the establishment of the Annual Finance and Credit Plan (AFCP) and the Foreign Exchange Plan (FEP) in the early 1970s, respectively, to administer interest rates and exchange rates (BoT, 2011). According to the BoT (2011), the latter entailed developing a foreign exchange allocation system to cater for the balance of payment crisis in 1970/71 and 1974/75. Confinement policy was adopted in 1972 to control all major economic activities including trade (BoT, 2011).

The BoT (2011) further laments that Government borrowing increased, credit continued to be controlled and directed to priority sectors at preferential interest rates, and bad debts by commercial banks heightened due to financial repression. Communal (Ujamaa) villages were built during 1974/75. The 1965 BoT Act was amended in 1978, providing BoT with an enhanced mandate of supervising banks and other financial institutions, as well as offer guarantee facilities to these institutions (BoT, 2011).

⁵ A policy of Socialism and Self-reliance aimed at creating an egalitarian society focusing on poverty alleviation and guaranteeing social services to the citizens.

The Tanzanian economy, however, encountered a number of economic shocks, both domestically and externally, in the 1970s. The global shock conditions are encapsulated in; the oil crisis in 1973-74 coupled with a severe drought, the 1974-75 global recession, coffee price boom 1975/76 and the second oil crisis in 1979 (Mtchallo, 1994). Resultantly the oil crisis led to a substantial rise in world prices. The recession led to 10% reduction in world trade and a significant reduction in export prices for most commodities. On the other hand, the second oil crisis accelerated by 130% (Mtchallo, 1994).

The domestic shocks included, but were not limited to, the drought of 1973, collapse of the East African Community in 1977, and the 1978/ 79 war with Uganda (Mchallo, 1994). The collapse of the EAC particularly, had downside effects on the operational institutions that were jointly operated in the sectors of transportation, telecommunications and manufacturing (Adar, 2011).

The global and domestic shocks of the 1970s, especially the overlapping shocks in late 1970s, plunged Tanzania into an economic crisis – manifested in deteriorating economic performance in terms of worsening terms of trade, double digit inflation, and slow growth rates (Mchallo, 1994; BoT, 2011). Table 4.1 shows Tanzania's selected economic indicators for the period from 1966 to 1985.

Table 4.1 : Selected Economic Indicators for Tanzania (1966-1985)

Year	Real GDP Growth Rate (%)	Inflation Rate (%)	Current Account to GDP (%)	Money Supply (M2) Growth Rate (%)	Money Supply (M3) Growth Rate (%)	M2/GDP (%)	M3/GDP (%)	Interest Rate Spread (%)	Fiscal Deficit/GDP (%)	Domestic Financing (Millions of Shillings)
1966	-	-	2.4	-	-	17.6	17.6	5.5	-3.3	155
1967	4.00	-	1.3	21.3	21.3	20.9	20.9	5	-4.0	167
1968	5.20	-	-0.8	-2.6	-2.6	19.1	19.1	5	-3.7	232
1969	1.80	-	2.8	25.4	25.4	23.2	23.2	4.5	-3.9	237
1970	5.80	2.40	-1.1	18.1	18.1	24.2	24.2	4.5	-3.6	229
1971	4.20	4.80	-5.2	18.2	18.2	26.7	26.7	4.5	-5.0	251
1972	6.70	9.10	-3.4	17.7	17.7	27.7	27.7	4.5	-4.5	255
1973	3.10	10.40	-5.1	18.2	18.2	27.9	27.9	4	-4.1	329

Year	Real GDP Growth Rate (%)	Inflation Rate (%)	Current Account to GDP (%)	Money Supply (M2) Growth Rate (%)	Money Supply (M3) Growth Rate (%)	M2/GDP (%)	M3/GDP (%)	Interest Rate Spread (%)	Fiscal Deficit/GDP (%)	Domestic Financing (Millions of Shillings)
1974	2.50	18.90	-12.1	22.1	22.1	27.9	27.9	4	-4.1	431
1975	5.90	27.00	-8.9	24.4	24.4	29.2	29.2	4	-6.2	579
1976	6.40	6.30	-1.5	25.1	25.1	27.9	27.9	4	-3.6	445
1977	0.40	17.60	-1.8	20.2	20.2	28.9	28.9	4	-6.8	1232
1978	2.10	7.00	-11.1	12.6	12.6	28.5	28.5	2.5	-6.4	1320
1979	2.40	12.10	-7.6	46.9	46.9	38.1	38.1	2.5	-7.5	1957
1980	3.00	30.80	-10.1	26.9	26.9	41.5	41.5	3.75	-11.4	3601
1981	-0.50	25.70	-6.4	18.1	18.1	40.0	40.0	3.25	-8.4	3659

Year	Real GDP Growth Rate (%)	Inflation Rate (%)	Current Account to GDP (%)	Money Supply (M2) Growth Rate (%)	Money Supply (M3) Growth Rate (%)	M2/GDP (%)	M3/GDP (%)	Interest Rate Spread (%)	Fiscal Deficit/GDP (%)	Domestic Financing (Millions of Shillings)
1982	0.60	28.90	-8.2	19.5	19.5	39.9	39.9	2.25	-8.1	4157
1983	-2.40	27.10	-4.0	17.8	17.8	41.9	41.9	2.5	-4.4	2228
1984	3.40	36.10	-3.3	3.7	3.7	35.4	35.4	2.5	-7.2	5489
1985	4.60	33.30	-5.2	29.0	29.0	34.7	34.7	3.5	-5.8	4037

Source: Authors computations based on data from BoT (2011)

Table 4.1 shows that real GDP growth that was 5.8% in 1970 decelerated to a negative territory in the early 1980s, while inflation that was near 2% accelerated to 30% in 1980. The fiscal deficits, excluding grants that averaged 3.7% in the first five years after independence, increased to an average of 8.1% between 1977 and 1982, as shown in Table 4.1. Over the corresponding period, excessive government borrowing and printing of money to bail out insolvent banks was encountered, which in part saw broad money supply grow at an annual average of 7.5%.

The early 1980s marked the beginning of economic reform negotiations between Tanzania and the IMF and World Bank, aimed at transforming the Tanzanian economy from socialist macroeconomic policy frameworks to a free market economy. This would entail *inter alia* trade liberalization and privatization of the public sector. A couple of home-grown programmes were initiated as foundations to the subsequent comprehensive IMF recovery programmes (Ndulu, 1987). Additionally Ndulu (1987) highlights that the 1980 standby agreement with the IMF was halted following the failure by Tanzanian government in meeting the credit requirements.

The one-year adjustment programme, the National Economic Survival Programme (NESP), launched in 1981, aimed at increasing domestic revenues; mitigate government expenditure, increasing foreign exchanges and management of foreign exchanges. However, the reforms including the buildup of foreign exchange reserves, did not materialise due to the lack of sufficient foreign inflows to finance its current account deficits, leading to the adoption of the three-year Structural Adjustment Programme (SAP) in 1982 aimed at restoration of the pre-crisis output, reduction of fiscal deficits, reduction of money supply, and creating a sustainable external balance (Mchalla, 1994; Ndulu, 1987). In 1984, the partial devaluation and import liberalisation were initiated; allowing individuals to import with declaring the source of their foreign exchange and exporters were allowed to retain a share of their earnings (Ndulu, 1987).

Despite the rolling out of the SAP, the economic crisis persevered in the early to mid-1980s, recording negative real economic growth in early 1980s, worsening trade balance, high and increasing inflation and widespread shortages and high parallel market spreads (see Table 4.1). Imports declined from 25 % of GDP in the 1970s, to 12 % of GDP in 1983 and 1984 while exports declined from 17 % to 6 % of GDP in

the same period (Maehle *et al.*, 2013). However, economic growth that was negative in 1983 picked up to 3.4% and 4.6% in 1984 and 1985, respectively (BoT, 2011). Fiscal deficit excluding grants reduced from double digits in 1980 to 7% in 1985. The proportion funded through bank borrowing reduced as well (Ndulu, 1987).

Socialism and state dominance prevailed until 1985, and thereafter the Economic Recovery Programme (ERP) was adopted a year later, aimed at liberalisation of economy (BoT, 2011). Monetary policy operated through direct controls of credit, interest rates, and exchange rates were administered. Government securities were issued directly to state-owned institutions and fiscal policy prevailed dominantly over the monetary policy (Nord *et al.*, 2009).

Monetary policy, coupled with socialist macro-economic policies, arguably was ineffective over this period as inflation was in double digits for most of the period and growth rates decelerated into negatives in the early 1980s. The heavy state dominance, increased surge in foreign aid and excessive government borrowing were associated with elements of macro instability and distortions in key markets (Nord *et al.*, 2009). The exchange rate remained practically unchanged, with the parallel market premium increasing from around 40% in 1970 to about 250% in 1980-85; peaking at over 700% in March 1986 (BoT, 2011; Maehle *et al.*, 2013). The high exchange rate premium (extra cost above the official buy price of foreign exchange) explained the inflationary trend over the corresponding period (Rutasitara, 2004).

4.3 Monetary Policy Reforms and Economic Performance in Tanzania (1986-2014)

Further to the IMF and World Bank led attempts in early 1980s, a comprehensive Economic Recovery Programme (ERP) was agreed on still with the IMF and World Bank in 1986, aimed at accelerating structural reforms and restoring economic stability. The overarching aim was to liberalise the internal and external trade, unify the exchange rate, revive exports, stimulate domestic saving, and restore fiscal sustainability (BoT, 2011). This was followed by the adoption of the 1989-1992 Economic and Social Action Plan (ESAP) to further the liberalisation efforts as well

as to include reforms in the banking sector, agricultural marketing, the parastatal sector, government administration, and the social sectors (Nord *et al.*, 2009).

Financial reforms started in 1987, with interest rate adjustments designed to move real interest rates into the positive territory. Following the establishment of Nyirabu (presidential banking) Commission in 1988, to revive the banking industry, the Banking and Financial Institution Act (BFIA) was enacted in 1991, setting ground for private banking, and leading to the establishment of Loans and Advances Realisation Trust (LART) in a bid to address the large portfolio of non-performing loans (Nord *et al.*, 2009). In 1991, there were only six deposit taking financial institutions. Despite the entry of new private banks, six bank and financial institutions failures were encountered in the 1990s (Nord *et al.*, 2009).

Following the adoption of the crawling peg exchange rate regime in 1986, the real effective exchange rate system was depreciated by more than 60% for two consecutive years between 1987 and 1989 (Nord *et al.*, 2009). A Foreign Exchange Rate Act was enacted in 1992 to replace the Exchange Control Ordinance, thus allowing the introduction of bureaux the same year, and the weekly auction of foreign exchange in 1993. This ultimately led to the unification of the bureaux, commercial banks and the official exchange rate (Rutasitara, 2004). The Interbank Foreign Exchange Market (IFEM) subsequently replaced the auction markets in 1994. The exchange rate has been allowed to float freely since 1996, with very limited central bank intervention so as to smoothen the volatility (BoT, 2011; Maehle *et al.*, 2013).

Capital markets establishment commenced in the 1990s, with the enactment of the Capital Market and Security Act, 1994, subsequently leading to the establishment and operationalization of the Dar es Salaam Stock Exchange and the interbank money market by 1998 (BoT, 2011). Tanzania, unlike its EAC counterparts, Uganda and Kenya, did not remove the quantitative controls on the capital account (Berg *et al.*, 2013).

The 1991 Banking and Financial Institutions Act set a foundation for the liberalization of the banking sector by empowering BoT to govern Banking activities and leverage private sector participation (Mutaitina, 1999). The 1995 BoT Act amendment further mandated the central bank to ensure financial stability (including supervision of the

private credit reference bureaus) but also explicitly granted autonomy to conduct monetary policy. The primary objective of BoT was then price stability (BoT, 2011). These regulatory reforms were able to leverage bank restructuring, starting with the three banks that existed (NBC, Tanzania Housing Bank, and Cooperative and Rural Development Bank). By the end of 2010, the number of banks had increased to 42 (BoT, 2011).

Fully fledged liberalisation of the interest rates did not happen until the 1990s. The Treasury bill auction was introduced in 1993 – with the Treasury bills of shorter term (35 and 91 day) and the longer term Treasury bills (182 and 365 days) were introduced in 1994. The positive real deposit rate requirement, liquidity asset ratio and the credit ceiling on lending to commercial banks were abolished in 1994, 1995 and 1996 respectively (Odhiambo, 2011). Two-year bonds and the longer term bonds (five, seven and ten years) respectively got introduced in 1997 and 2002 (BoT, 2011).

A three-year Rolling Plan and Forward Budgeting (RPFB) was introduced in 1993 to guide the annual budget planning and projections, following the abandonment of the five-year development plans in the early 1990s. The implementation of RPFB led to downsizing of the fiscal deficits in the remaining period of the 1990s (Bird, 2003)

In addition, the 1990s became the epoch of monetary policy reform, transitioning to indirect monetary policy with the adoption of a monetary targeting framework in 1993 (BoT, 2011). The reserve money and the broad money (M2)⁶ became operational and intermediate targets respectively. The BoT Act was further amended in 1995, providing a narrowed mandate, emphasizing primary focus of price stability.

The bank also uses a number of indirect monetary policy instruments (BoT, 2011). The open market operations have been in place since the first auction of government securities in 1993/94. Other instruments include minimum statutory requirements introduced later in the 1990s and the standby credit discount window and Lombard facility initiated in 2003. The minimum statutory requirements of the 1990s remained

⁶ M2 is the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings deposits while M3 is M2 plus and foreign currency deposits of resident sectors other than the central government.

in place until 2009, when the reserve requirements on central government deposits were introduced at 20% (BoT, 2011). Repurchase agreements (Repos) with maturity of 1-21 days were introduced in 2007. Moral suasion was also used as a monetary instrument. Monetary targets were set using end-period money stocks until 2006; and thereafter, an average reserve money was adopted (BoT, 2011).

In 2006, Parliament approved the BoT Amendment Act and the Banking and Financial Institutions Act (BoT, 2011). The former enhanced the central bank's autonomy and espoused more political independence, encouraging a harmonious mix of fiscal and monetary policies. The latter provided for strict measures on licencing, and bank supervision in terms of asset quality and capital adequacy (Nord *et al.*, 2009).

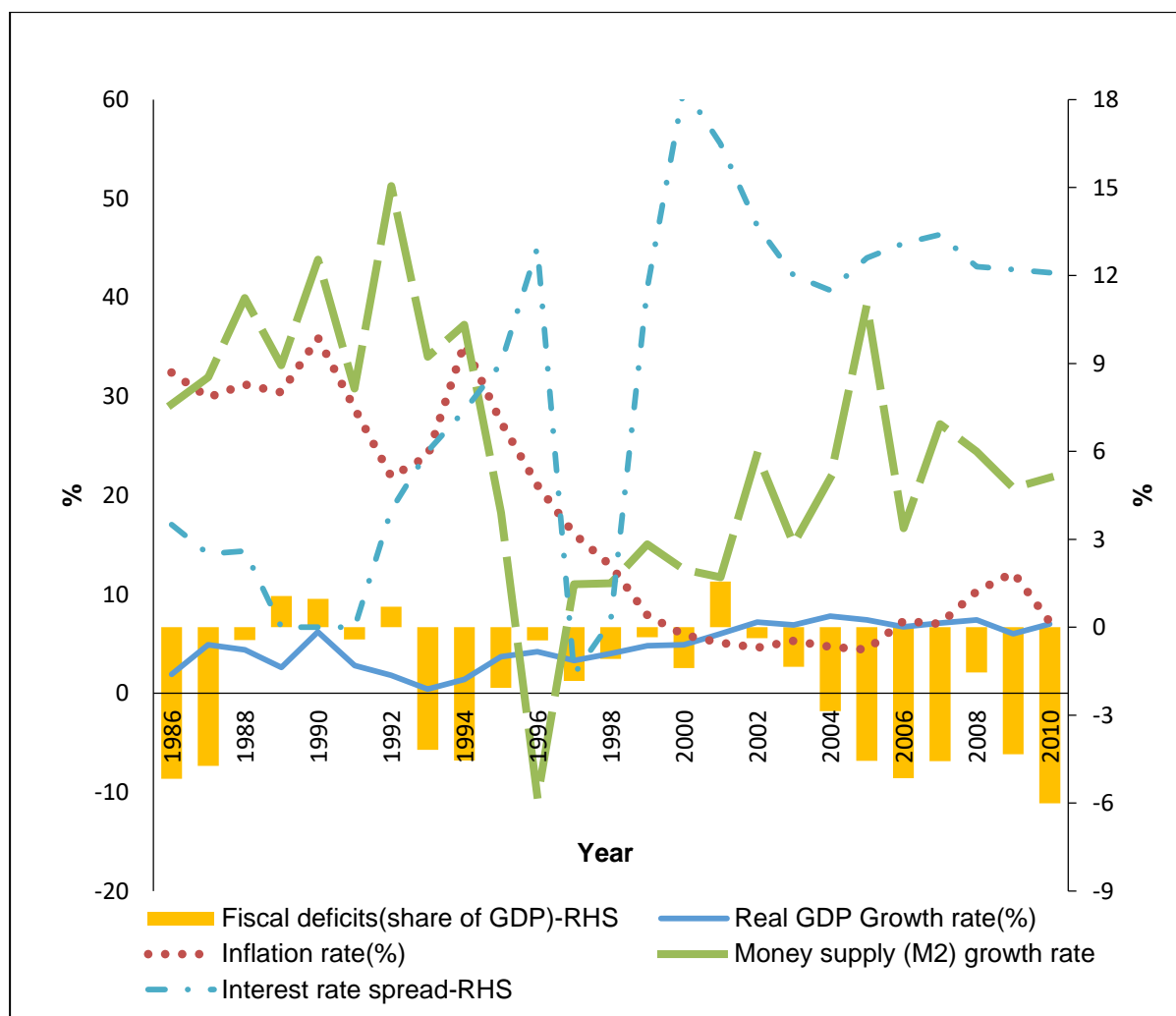
The BoT, unlike its EAC partners (Uganda and Kenya) that have in the recent past, adopted policy rates as operational target continues to pursue monetary targeting in a bid to achieve the primary objective of maintaining domestic price stability conducive for a balanced and sustainable growth of the national economy (Andrle *et al.*, 2013). The Treasury bills market continues to provide an anchor to market determined interest rates. Annual monetary policy targets are set at the beginning of each financial year, and reviewed mid-year (Berg *et al.*, 2013). Pursuance of the objective of maintaining domestic price stability, the BoT Board of Directors Monetary Policy Committee announces the monetary policy stance every two months (BoT, 2013).

While Tanzania is a member of (SADC) which had aimed to attain a monetary union by 2016, it has also signed the East African Monetary Union Protocol in November 2013 and was the first country to ratify the protocol in June 2014 (BoT, 2014). The Protocol sets a 10-year road map for single currency and all countries are expected to implement the economic policies in line with the agreed performance criteria with effect from 2021 (BoT, 2014).

The performance convergence criteria require a headline-inflation target of a maximum 8%, a fiscal deficit, including grants as a %age of GDP of 3%, present value of public debt, as a per cent of GDP of an utmost 50%, and a foreign-exchange reserve cover of at least 4.5 months of import value (BoT, 2014). From 2024

onwards, a single currency was mandated to be adopted, provided that at least three partner states had met the performance target for at least three consecutive years (Morales, 2012). Figure 4.1 shows select economic indicators between 1986 and 2010.

Figure 4.1: Economic Indicators for Tanzania (1986-2010)



Source: Authors computations based on data from BoT (2011)

Figure 4.1 shows that from the onset of reforms in 1986 to mid-1990s, the economic performance remained gloomy in this respect: output growth averaged 3% between 1986 and 1995; inflation remained in double digits – averaging 30% over the same period; the current account as share of GDP increased from 4.5% to 16%; and the interest rate spread more than doubled over same period. However, also illustrated in

Figure 4.1, the fiscal deficit excluding grants has increased from just 2% in 1995 to 6% in 2010.

The judicious mix of economic policies encountered from mid 1990s, including the monetary policy coupled with reinforcement of the early 1990 reforms, was associated with a positive co-movement in macro-economic performance (BoT, 2011). Figure 4.1 shows that real GDP growth rate nearly doubled from 3.7% in 1995 to 7% in 2010, while inflation dwindled from 27% in 1995 to single digits for most of the 2000s. The latter is attributed to the respective tight monetary policy, with money supply (M2) growth rate easing to an annual average of 9.6% between 1996 and 2000 (BoT, 2011). Table 4.2 shows the regional real GDP growth rates over the 1996 to 2013 period.

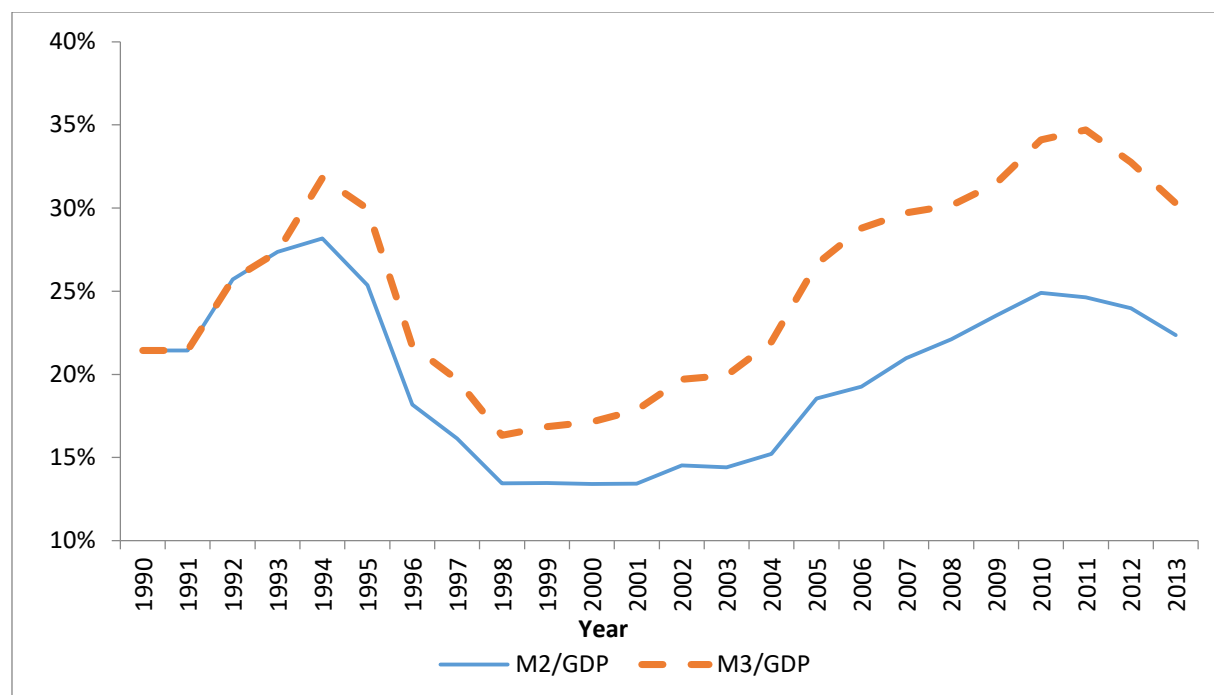
Table 4.2: Selected Sub-Saharan African Regional Real GDP Growth Rates (%)

Country	1996-2005 (Average)	2006	2007	2008	2009	2010	2011	2012	2013	1996-2013 (Average)
Burundi	0.9	5.4	3.4	4.9	3.8	5.1	4.2	4.0	4.5	4.0
Kenya	2.9	6.3	7.0	1.5	2.7	5.8	4.4	4.6	5.6	4.5
Uganda	7.0	7.0	8.1	10.4	4.1	6.2	6.2	2.8	6.0	6.4
Rwanda	8.7	9.2	7.6	11.2	6.2	7.2	8.2	8.0	5.0	7.9
Tanzania	5.5	6.7	7.1	7.4	6.0	7.0	6.4	6.9	7.0	6.7
Sub-Saharan Africa	4.7	6.3	7.1	5.7	2.6	5.6	5.5	4.9	4.9	5.3

Source: Authors computations based on data from IMF (2014)

The average annual real GDP growth rate for Tanzania has been relatively higher than its EAC partners and higher than the SSA average, as illustrated in Table 4.2. Figure 4.2 shows the money supply as share of GDP for Tanzania for the period 1990-2013.

Figure 4.2: Money Supply as share of GDP (1990-2010) for Tanzania



Source: Authors computations based on data from BoT (2014)

Financial deepening, often proxied by M2/GDP and M3/GDP, as illustrated in Figure 4.2, has encountered dwindled period between 1996 and 2002, but has since risen to its early 1990s levels. Over the corresponding period, the gap between M2/GDP and M3/GDP has widened, illustrating the increased levels of foreign currency deposits. Overall, the level of financial dollarisation has increased rapidly and is relatively high compared to EAC countries (Kessy, 2011).

Tanzania has remained resilient to the global shocks that include the food and fuel price shocks of 2007/08, the financial crisis 2007-09, and the recent food and fuel price shock of 2011/12 (Berg *et al.*, 2013). The real GDP has averaged 7% over the 2004-2014 period; and inflation, which had risen to 20% in December 2011, has

since eased to single digits in single digits in 2014, owing to subdued growth rate in money supply and private sector credit (IMF, 2014b).

While the 1990s led to the easing of interest rates, the interest rate spread has since increased, which in part reflects the institutional, regulatory and structural rigidities⁷ in banking and financial sector at large (Montiel *et al.*, 2012).

Despite the sound economic progress since the early 1990s, Tanzania remains a Low Income Country (LIC). According to the World Bank Indicators of 2011, it has a real GDP per capita of US\$540. It also exhibits many characteristics of LICs, and has a high percentage of rural population, and a high dependency on aid. Its exports are dominated by commodity exports; and imports of goods and services account for a significant share of GDP (Berg *et al.*, 2013). Table 4.3 shows the selected economic structure indicators for Tanzania.

Table 4.3: Selected Economic Structure Indicators for Tanzania

	Exports (% of GDP)	Imports (% of GDP)	Commodity Exports (% of Total Exports)	High Tech Exports (% of Total Manufactured Exports)	Official Development Assistance (% of GDP)
Tanzania	28.22*	43*	73**	10.17	10.22
SSA	31.9	39.5	-	4.3	3.2
LIC	23.2	33.7	64	-	7,4
HIC	-	-	19.5	17.4	0

Source: Authors computations based on data from World Bank (2013). *2013 figures, ** 2011 figures otherwise 2012 figures.

⁷ These include, but are not limited to: security of property rights, quality and enforcement of its accounting, disclosure standards, bankruptcy laws and asymmetric information on the domestic borrowers.

Table 4.3 corroborates the view that Tanzania lies with threshold categorization of LICs, with high levels of commodity exports to total export, low levels of high tech exports to total manufactured exports, and still highly dependent on foreign aid.

4.4 Financial and Economic Structure of Tanzania

Empirical studies find weak transmission mechanisms of monetary policy into its policy objectives in LICs which are in part and strongly so attributed to the respective nation's financial architecture, linkage with external financial markets and the respective exchange rate regime (Montiel *et al.*, 2012). The financial architecture aspects that matter include, but are not limited to a developed and competitive financial sector, adequate capitalisation of financial players, well developed liquid interbank money market, liquid secondary market for government securities and liquid real estate and equities markets (Montiel *et al.*, 2012). This section provides an exploratory review of Tanzania's financial structure and exchange rate regime.

The financial sector in Tanzania, which is composed of banking, insurance, micro finance and the pension sector is dominated by the banking sector. As of March, 2014, the banking sector assets, which stood at 37.9% of GDP, accounted for about 70% of total assets of the financial sector (BoT, 2014). Also BoT, (2014) underscores that the banking sector in Tanzania remains liquid, adequately capitalised, and profitable with in the thresholds of its EAC partners. In addition, according to the stress tests on the balance sheet, the banking sector is resilient to the shocks in exchange rate, interest rate, and credit (BoT, 2014).

Tanzania's financial development remains relatively low, despite registering impressive financial and monetary sector growth from the early 1980s. The M2/GDP ratio and bank credit to private sector as share of GDP – common proxies of financial deepening in 2012 – were comparatively lower than the LIC average of 45.8% (Berg *et al.*, 2013). In addition, stocks traded and market capitalisation indicators compare unfavourably to the LICs and HICs (Berg *et al.*, 2013). Table 4.4 shows selected financial development indicators for Tanzania for 2012.

Table 4.4: Selected Financial Development Indicators for Tanzania (2012)

	Bank Credit to Private Sector(% of GDP)	Market Capitalization of Listed Companies (% to GDP)	Stocks Traded, Total Value (% of GDP)	M2/GDP (%)
Tanzania	17.73	6.4	0.09	32
Low Income Countries	18	20.80*	4.9*	45.8
Sub-Saharan	-	68.2	29,80	40.6
High Income Countries	133.7	86.4	82.7	107

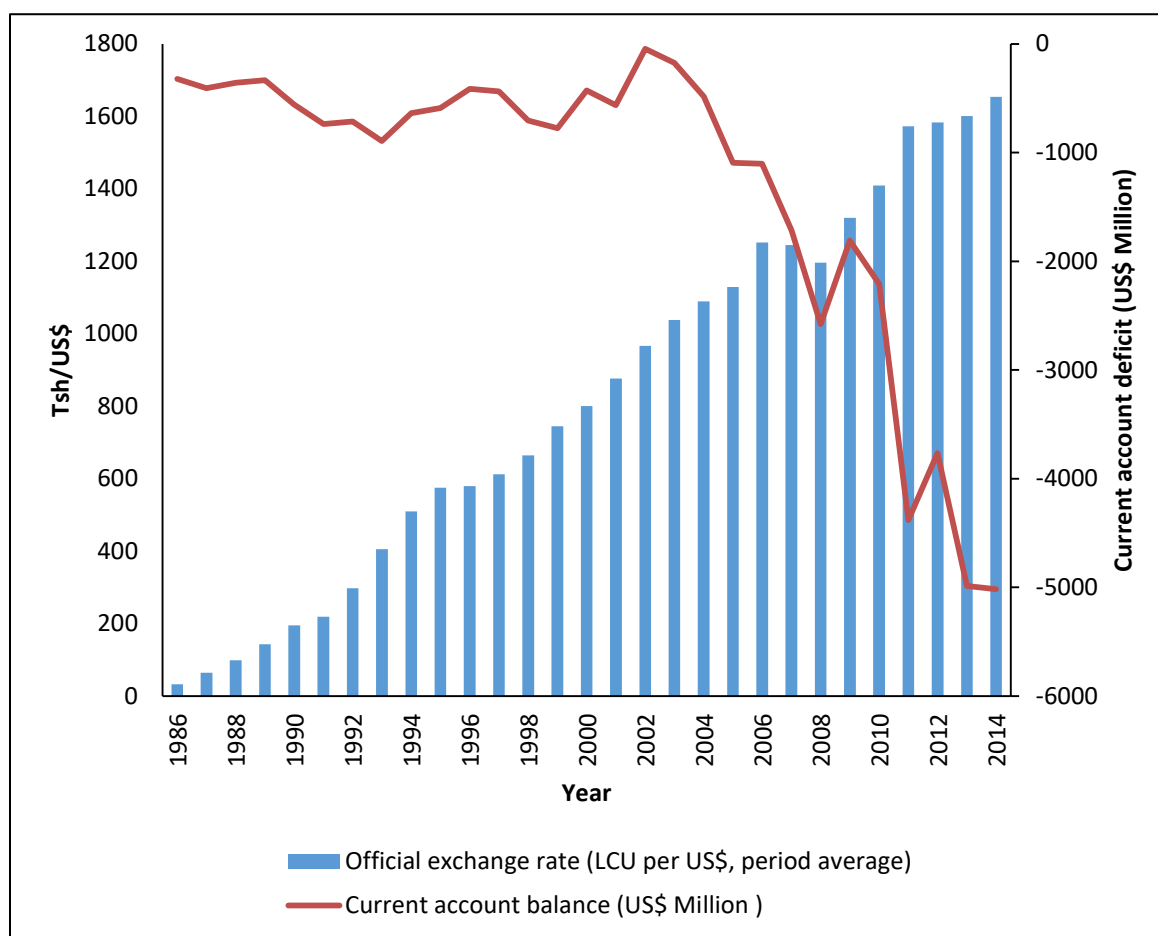
Source: Authors computations based on data from World Bank (2013). Note: * 2011 figures.

Tanzania's level of financial development, shown in Table 4.4, compares unfavorably to the LICs and SSA average.

4.4.1 Exchange Rate Regime and Capital Account of Tanzania

According to the IMF (2013), Tanzania's exchange rate is classified as a floating exchange rate. The BoT, however, is a dominant player in the exchange rate market for purposes of liquidity management and smoothening the exchange rate volatility. The BOT announces the amount to be sold in the market through the dealing system on a monthly basis (IMF, 2013b). Figure 4.3 shows the trend for the official exchange rate (local currency against the US\$) and the current account deficit for Tanzania over the period from 1986 to 2010.

Figure 4.3: Exchange Rate and Current Account Deficit for Tanzania



Source: Authors computations based on data from BoT (2011) and World Bank (2013)

Table 4.3 shows that the liberalisation of the exchange rate period from 1993 onwards, has been associated with the gradual depreciation of the Tanzania shilling and worsening trend in the current account deficit. The pace of depreciation of the shilling has been more pronounced since 2006.

The Chinn-Ito index (KAOPEN) measures a country's degree of capital account openness using information from IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), with a higher value which corresponds to fewer restrictions in international transactions. The index uses maximum value of 2.5 for the most financially open economies, and a minimum of -1.9 for the least financially open. Table 4.5 shows the Chinn Ito Index of capital account openness for EAC.

Table 4.5: Chinn Ito Index for Tanzania versus EAC Countries (2008-2012)

Year	Tanzania	Uganda	Kenya	Rwanda	Burundi
2008	-1.17503	2.421764	1.110897	-1.17503	-1.87502
2009	-1.17503	2.421764	1.110897	-1.17503	-1.87502
2010	-1.17503	2.421764	1.110897	-0.91286	-1.87502
2011	-1.17503	2.421764	1.110897	-0.65068	-1.87502
2012	-1.17503	2.421764	1.110897	0.839695	-1.87502

Source: Authors computations based on data from Chinn- Lto (2015)

The 2008, *de jure* Chinn Ito Index of capital account openness, shown in Table 4.5, indicates that Tanzania has enjoyed limited financial integration relative to EAC regional peers. As illustrated in Table 4.5, Tanzania scores -1.75 compared to Burundi's -1.87 and Uganda's 2.42. The findings reflect that Tanzania has maintained quantitative controls on its capital account but BoT has taken initial steps to liberalise capital account by the removal of quantitative controls on capital movements within the EAC region (IMF, 2014b).

4.5 Challenges Facing Monetary Policy Effectiveness in Tanzania

Tanzania has an independent central bank as mandated by BoT, Act 2006, and operates a floating exchange rate system. It also maintains a closed capital account and increasingly has a deepening level of bank competition (Nord *et al.*, 2009). Using the Central Bank Independence Unweighted (CBIU) and Central Bank Independence Index Weighted (CBIW), it is the 34th most independent central bank of 88 banks scoring 0.58 and 0.56 respectively (Dincer and Eichengreen, 2014). The index uses 0 for lowest and 1 for highest levels of independence, respectively.

According to Rey (2013), independent monetary policies are possible if and only if the capital account is managed. Capital controls can strengthen the impact of

sterilisation policy by insulating the economy from interest arbitrage (Prasad, 2013). These factors in part indicate a substantial degree of monetary policy autonomy (Montiel *et al.*, 2012). The autonomy of the central bank is significantly important for the effectiveness of monetary policy (Bernanke, 2010). However, the conduct of monetary policy in any country remains unnerving, given that monetary policy is a short-term stabilisation mechanism against domestic and external shocks. The challenges *inter alia* are institutional, technical, and structural (Hammond *et al.*, 2009).

In addition to the primary mandate of ensuring price stability, BoT is also mandated to leverage a conducive environment for vibrant economic growth, as well as to ensure financial stability (Berg *et al.*, 2013). The BoT continues to play a significant role in determining the path and stability of the exchange rate. In addition to the non-monetary roles, the central bank remains at the risk of an impossible Trilemma especially in the wake of huge gas discoveries (BoT, 2011). The latter is often associated with huge capital inflows.

Tanzania has, in the recent past, attracted the highest level of FDI by volume in the EAC, and it was only overtaken by Uganda in 2012 (UNCTAD, 2013). In addition, Tanzania continues to receive significant levels of aid flows (IMF, 2014b). These arguably lead to changes in reserve money being erratic (Batini *et al.*, 2005). The increase in foreign capital inflows risk reducing the monetary policy autonomy by increasing the foreign exchange reserves that may be used for domestic financing. The associated fiscal expansion often leads to inflation and increases in sterilisation challenges, thereby leading to crowding out of the private sector (Berg *et al.*, 2010). Aid flows also lead to short-run real movements in the exchange rate and a shift of resources from the traded to non-traded goods sector (Fielding and Gibson, 2012).

The impossible Trilemma challenge becomes more pronounced with a volatile exchange rate (Berg *et al.*, 2010). The exchange rate in Tanzania has been susceptible to shocks, given the recent surge in current account deficit of 18% of GDP in 2011/12 and 14% in 2012/13. The foreign exchange reserves remain nearly on the lower adequacy boundary, at 4 months of current year imports of goods and services of 2013/14 (IMF, 2014b).

It is also worth noting that Tanzania's financial sector is still relatively small, and is dominated by the banking industry. The domestic debt market is dominated by commercial banks, accounting for 48%, followed by the BoT at 28%, and pension funds at 16% (IMF, 2014b). In addition, the liberalisation of the banking sector has not led to a reduction in the interest rates. To some extent, this could be attributed to the low levels of bank competition (Mlachila *et al.*, 2013).

Limited bank competition weakens the bank interest rate channel; and any policy changes may not be transmitted to the lending and deposit rates. The perseverance of high intermediation costs is partly due to the institutional and regulatory weakness, which inexorably heightens the financial intermediation costs and limits the transmission of monetary policy actions (Montiel *et al.*, 2012). According to the IMF (2014), Tanzania faces institutional and regulatory weaknesses, which relate mainly to regulations, access to land, taxation and fees, corruption, labour laws, contract enforcement, and law and order.

According to Financial Sector Deepening Trust (2013), Tanzania still has more than a quarter of its population excluded from financial access, with even a higher proportion in the rural areas at 83%. It also has a high proportion of the population who use non-bank financial services. The latter is consistent with the rapid growth in mobile money over the years, to over 50% of the population using mobile money by 2013. Also by September 2013, the mobile money transactions by value stood at USD 12.3 million, with 714,930,074 transactions since its launch (Di Cashi and Gidvani, 2014).

The rapid growth of mobile money, coupled with other financial innovations, tends to improve financial efficiency but at the same time, tends to complicate the conduct of monetary policy in the transition period. The financial innovations are often associated with instability of money multiplier, velocity and money demand as well as tend to alter the financial behaviour of economic agents (Noyer, 2007; Nyamongo and Ndirangu, 2013)

Tanzania also has high levels of dollarisation, with foreign deposits accounting for 33% of the total deposits, and net foreign assets accounting for 45% of M3, as of March 2012 (BoT, 2013). The dollarization in part explains the great substitution within M3 (Adam *et al.*, 2010b). Greater dollarization weakens the monetary

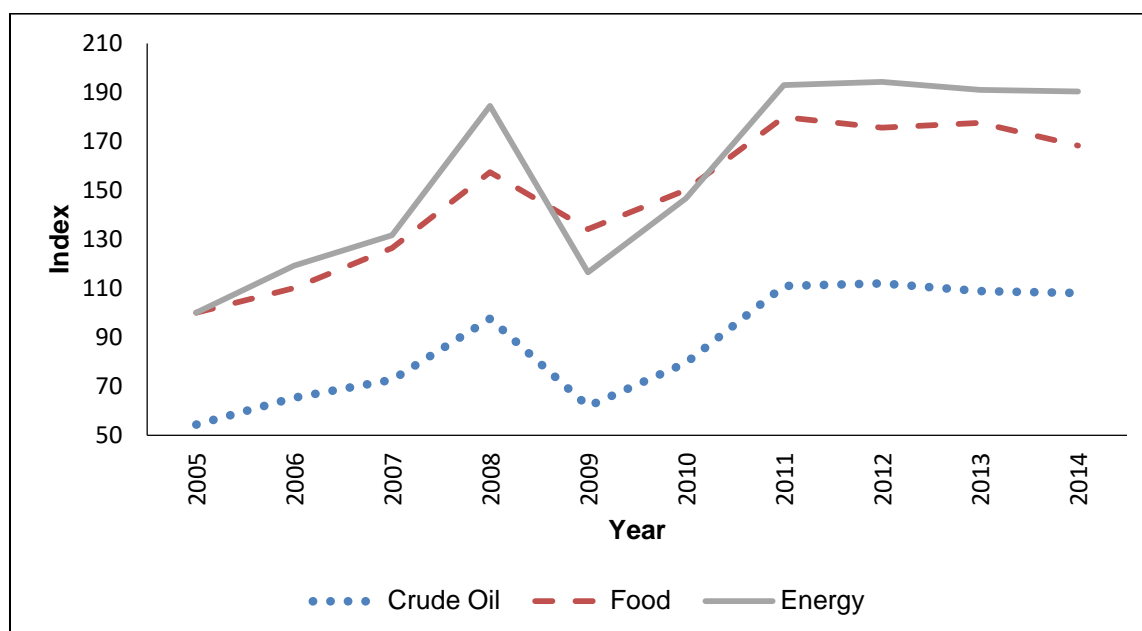
autonomy, especially when the monetary target is that of M2, as it is in Tanzania. The foreign deposits and the excess reserves tend to be invested in government securities, as opposed to the private sector, ultimately weakening the bank credit-lending channel (Saxegaard, 2006).

Dollarized deposits increase the likelihood of asset booms; since they are susceptible to cross-border spill-overs. Banks become even more reliant on parent groups and are increasingly exposed to uncertainty in the foreign currency markets (Szpunar and Głogowski, 2012). The Tanzanian economy also remains largely a cash economy, with currency in circulation accounting for about 23% of the broad money (M2) supply, which impairs the effectiveness of monetary policy (BoT, 2011).

The global environment in the recent past has made monetary policy in developing countries more complex, and Tanzania is no exception (Berg *et al.*, 2013). Economies of developing countries, including that of Tanzania, have been susceptible to recent shocks: the food and fuel price shocks of 2007/08; the financial crisis of 2007-09; and the recent food and fuel price shocks of 2011/12 (Berg *et al.*, 2013). The global shocks seem to have overlapped with the rising inflation in Tanzania (IMF, 2014a).

Figure 4.4 presents World Commodity Price Index with base year of 2005.

Figure 4.4: World Commodity Prices (Index, 2005=100)



Source: Authors computations based on data from IMF (2014).

Figure 4.4 shows that international crude oil, energy and food prices have risen since 2005, and are exhibiting some short term shocks.

The Tanzanian economy remains largely rural; and like many developing economies, it is likely to encounter dominant supply shocks over the demand shocks. The supply shocks tend to increase the probable conflict between output and inflation (Adam *et al.*, 2010b). Monetary targeting is tailored to control core inflation; but this may be flawed, given that the weight of food prices in the CPI accounts for 47 % (Berg *et al.*, 2010). The targeting of core inflation, when food and fuel are dominant drivers of headline inflation, so often leads to unpredictable inflationary outcomes (Hammond *et al.*, 2009).

Fiscal policy is an integral part of integral part of monetary policy and its prudence is essential for its effectiveness policy (Goodhart, 2012). The IMF (2014b) notes that Tanzania rising fiscal deficits reached 11.4% in 2010/11 before easing to 8.5% in 2013/14. The total public debt has, however, increased from 42.6% in 2010/11 to 47.1% by the end of June 2013 and there is also a growing trend in the expenditure floats to the tune of 1.3% of GDP in 2012/13 (IMF, 2014b). The huge gas discoveries, and the expected huge investments in the medium term, together with the

expectation of reducing aid dependency, indicate that the fiscal deficit is likely to increase. In such a case, the markets tend to perceive the outlook with bulging fiscal problems, huge capital outflows and the associated inflation. Fiscal deficits tend to impact negatively on the economy's growth via the interest rate channel, as higher interest rates crowd out domestic investments (Hammond *et al.*, 2009).

Expansionary fiscal policies also tend to crowd out the monetary autonomy, at the peril of the central bank's credibility, at the extreme, forcing the Central Bank to abandon the price stability, and to adopt the role of keeping the interest rates low (Hammond *et al.*, 2009).

Tanzania, as a member of SADC and EAC, is committed to the convergence criteria of both regional monetary unions, which are not necessarily co-ordinated with each other. Tanzania is the first country to ratify the EAC monetary union protocol. The overlapping commitment will also put a strain on the limited BoT resources, human or otherwise (BoT, 2014). As of December 2013, Tanzania partially meets the EAC performance criteria indicators (BoT, 2014).

4.6 Conclusion

This chapter discusses monetary policy, financial sector reforms and the associated economic performance for Tanzania from 1966 to 2014. The exploratory review in this chapter focuses on two major episodes. The first phase between 1966 to 1985 period was characterised by a policy framework undertaken largely through government controlled frameworks, in a small financial sector. Secondly the 1986 to the 1990s period focused on the financial and economic reforms aimed at liberalization of key markets. The actualisation happened in the 1990s with the full liberalisation of interest rates, exchange rate and adoption of indirect monetary policy. The chapter has also discussed challenges faced with the conduct of monetary policy in Tanzania. These challenges are mostly associated with the huge aid inflows, the global crisis shock, global fuel and food prices and rapid technological developments. These wide-ranging challenges could potentially impede the effective transmission of monetary policy.

CHAPTER FIVE

5. LITERATURE REVIEW

5.1 Introduction

This chapter discusses literature review (theoretical and the empirical) on monetary policy and economic growth. The chapter is divided into five sections. Section 5.2 reviews the theoretical literature on the relationship between monetary policy and economic growth. In Section 5.3, monetary transmission mechanisms are reviewed. Section 5.4 covers empirical literature review on monetary policy and economic growth. Finally, some concluding remarks are presented in Section 5.5.

5.2 Monetary Policy and Economic Growth: A Theoretical Framework

The evolution of theoretical underpinnings for the nexus between monetary policy and economic growth is dominated by ambiguities, controversies and divergences (Brunner and Meltzer, 1972). Monetary policy and economic growth theories predate the classical quantity theory of money. This was in part subscribed to by Smith (1776) who, when he penned "the inquiry into the causes and wealth of nations", considered labour force, capital accumulation and technological progress as main drivers of economic growth. The classical economists were adherent to the tenets of quantity theory of money (Blaug, 1996). The quantity theory assumed that money was exogenous a view corroborated in Keynesian liquidity preference theory in the 1930s, though interest rates were assumed to be a monetary phenomenon (Gali, 2008).

The cornerstone theory of economic growth is the neoclassical Solow growth theory which, however, indicates no role of monetary policy on economic growth (Meltzer, 1969). This theory considers – capital, labour and technology as engines of growth. The Solow growth model also became a benchmark for the factor productivity models which underscore labour productivity, capital per worker and technological progress as the main drivers of long-run growth (Sueyoshi, 2010). Thereafter the role of money was introduced into the production functions in the works of Tobin (1965).

These theories were then followed by other theories ranging from monetarism to the monetarist approach and the contemporary theories of new classical real business cycle; the new Keynesian model; and New Consensus Model. These contemporary theories are mainstay of monetary policy analysis in recent decades (Arestis, 2009; Fontana and Palacio-Vera, 2007). The latter theories embed the concepts of endogenous money and the role of monetary policy when money is endogenously determined (Arestis and Sawyer, 2008).

The theoretical evolution of monetary policy theories has, to a great extent, focused on the nature of monetary policy, long-run neutrality, the transmission mechanisms and effectiveness of monetary policy (Arestis, 2009). This section aims to explore the theoretical works on the impact of monetary policy on economic growth, both in the short run and long run. The section will also examine the monetary transmission mechanisms. It is, therefore, divided into seven sections – Sections 5.2.1 to 5.2.7 – that review theoretical literature on the relationship between monetary policy and economic growth.

5.2.1 NeoClassical Monetary Theory

The classical economic theory was premised on the quantity theory, which emphasizes a direct and proportional relationship between money and price level (Belke and Polleit, 2009). This classical equilibrium relationship framework is presented in the “Equation of exchange”. The associated Irving Fischer's equation, is presented as follows:

$$MV = PT \tag{5.1}$$

Where M is the amount of money in circulation, V is "velocity of money circulation ", T is the volume of transactions and P is the price level. Money holdings are for essentially fostering transactions.

In the standard form or transactions version of the quantity theory, the equation can be written as:

$$MV = PT \quad (5.2)$$

Where PT represents current nominal GDP and velocity is assumed to be constant. For a given level of money supply and equilibrium in the money market;

$$M^s = M^d \quad (5.3)$$

Where M^s is exogenous money supply and M^d is the money demand.

The macroeconomic demand curve can be reformulated from equation 5.2 such that;

$$Y = \frac{M}{P} V \quad (5.4)$$

Equation 5.4 implies that a contractionary/expansionary monetary policy will lead to direct contractionary/expansionary impact on output.

The Irving Fisher quantity theory of money, as stipulated in the equation of exchange, laid a foundation for the link of monetary policy (money) with the economic variables. The neoclassical theorists stipulate that money (only held as medium of exchange) has no effect on the real economic variables but on price alone, indicating price proportionality with money. The economy is assumed to prevail near the natural rate of full employment all the time (Mankiw and Taylor, 2007). The long-run economic

growth was only affected by real factors such as capital, labour, technology, tastes, natural resources, and rate of technical substitution between factors of production (Gali, 2008; Mankiw and Taylor, 2007). Money supply, which is assumed to be exogenous also has short-run neutrality (David, 2008).

The canons of the neoclassical theory premised on classical assumptions of perfect competition and the relevance of the real factors postulate that the quantity of money has no impact on real variables in the long run but have transitory effect on them in the short run. A reduction in the stock of money is usually associated with a hike in interest rates and a consequential reduction in the prices – which underscores that reduction in prices, will countervail any effect on real variables in the long run. The reverse is true when there is an increase in money stock, it would in the long run result into an increase in prices thus offsetting the short run effect on real variables (Gali, 2008; Mankiw and Taylor, 2007).

The assumptions of neoclassical theory of money have not been immune to criticisms, in particular, to the assumptions related to exogenous money; constant velocity of money; the role of money only as a medium of exchange; and that the economy operates at full employment (Goodhart, 1989; Mishkin, 2007a).

5.2.2 Keynesian Theory of Money

This theory assumes that money supply is assumed to be exogenous and any increase in the money supply, will lead to lower interest rate at which the quantity of money demanded equals the supply. Lower interest rates have a positive feedback on marginal efficiency of capital and investment, consequently leading to output expansion (Belke and Polleit, 2009).

The theory was also underpinned by Keynesian rejection of the notions and practical relevance of the quantity theory, disputing the notion of the quantity theory of automatic tendency of the economy to operate at full employment level (Keynes, 1936). Money is not always neutral; where money has a thrust on production, it can have real effects on output until attainment of full employment (Snowdon and Vane, 2005). Keynesian theory is underpinned by assumptions of rigidity of prices, unstable

velocity of money (is not constant) and that the quantity of money adjusted rapidly. as According to the liquidity preference theory, an endogenous Keynesian money demand function embeds both income and interest rates as dependent variables (Belke and Polleit, 2009). The liquidity preference is also shown below:

$$M = L_1(Y) + L_2(i) \quad (5.5)$$

Where M is the quantity of money demanded, Y is income and i is the interest rate. L_1 is positive and representing the transactional and precautionary motive of the liquidity preference theory while L_2 expresses the speculative motive of liquidity preference (Keynes, 1936). These motives exert influence simultaneously and are mutually independent. Money demand, therefore, is positively related with income and negatively with interest rate.

Money equilibrium in the liquidity preference theory is attained when the endogenous money demand equals the exogenous money supply (determined by the central bank). This equilibrium makes interest rates a monetary phenomenon whereby a reduction in money supply by the central bank, results into higher nominal interest rate at a lower money equilibrium level. The reverse is true. Monetary changes are therefore implicitly transmitted through money markets (interest rates) to the key economic agents (households and firms) and ultimately to the total economy. Lower interest rates have a positive feedback on marginal efficiency of capital and investment, consequently leading to output expansion, even in the long-run (Belke and Polleit, 2009).

Money is considered as a financial asset that affects prices (stock, interest rates) and quantity of trade (Knoop, 2008). Keynes underscored that monetary policy expansion would lead to changes in prices only if the economy is at full employment. If the economy is at less than full potential, then a monetary expansion may be associated with a rise (permanent) in output as opposed to a rise in prices (Snowdon and Vane, 2005).

The Keynesian theory remained dominant in the 1930s and 1940s, getting embedded eventually in the basic version of the IS-LM model (Hicks, 1937). The LM curve shows a positive linkage between output and interest rate consistent with the money market equilibrium levels, while the IS curve shows that a negative linkage between interest rates and output consistent with the respective goods and services market equilibrium levels (Hicks, 1937). The Investment Saving Liquidity Management framework has been empirically challenged (Robinson, 1962; Leijonhufvud, 1968; Backhouse and Bateman, 2011).

Keynes was skeptical about the effectiveness of money policy when the economy is in a liquidity trap and also about uncertainty in the financial markets. Keynesian supported a more pronounced role of the fiscal policy particularly when economy is in depression or recession (Belke and Polleit, 2009). The assumption of exogenous money supply in both classical and Keynesian theory had been equally challenged and discarded in subsequent and modern theories (Romer, 2006). Prolonged low interest rates in the Keynesian liquidity preference theory are also believed to have distortions in the form of unsustainable asset price bubbles and toxic credit (Schwartz, 2009).

5.2.3 Monetarism

Monetarist theory birth is traced to Friedman (1956) paper "*The Quantity Theory of Money (QTM) - A Restatement*" (Cagan, 1989). Monetarist theory assumes the stability of the velocity of money in the quantity theory of money thereby indicating that nominal income is dependent on the level of money supply (Friedman and Schwartz, 1963a; Friedman 1968, 1970). The income form of the quantity theory is expressed as

$$MV = PY \tag{5.6}$$

And the Cambridge cash balances approach to the QTM is expressed as

$$MV = kPy \quad (5.7)$$

k is the reciprocal of Velocity (V), and V is defined in equation 5.2.

Monetarists upheld the principle of tradeoff between inflation and output. They adjusted the nominal wages for inflation in the Philips curve (Gottschalk, 2005). Labour supply and demand is tenable at the natural rate of employment and assumptions of sticky wages and prices prevail which implies that money affects real income only in the short run. An increase in money stock has a transitory positive impact on real output (GDP) and employment in the short run, but has no effect in long run due to countervailing effect of inflation. Money supply in the long-run is inflationary, thus theory assumed long-run monetary neutrality. Money supply correlates with money GDP, and everything else (wages, consumption, investment, wealth and others) follow. The changes in real variables are only temporary and that the impact on nominal variables is with a time lag (Cagan, 1989).

Empirical monetarism can be traced in Friedman and Schwartz (1963b) and Friedman (1968, 1970). Friedman (1970), on the premise of stable money demand function, avers that nominal money supply leads to substantial variation in output. The monetarist theory assumes long run monetary neutrality where by an increase in the quantity of money has a transitory impact on real variables (consumption, GDP and employment) in the short run but has no impact on real variables in the long run (Cagan, 1989). There is growing scholarly works that corroborate the long run monetary neutrality (Geweke, 1986; McCandless and Weber, 1995; Bernanke and Mihov, 1998; Bullard, 1999; Nogueira, 2009). A constant money growth rule (Friedman rule) was assumed, requiring the targeting the growth rate of money to equal the growth rate of real GDP, leaving the price level unchanged. Friedman argued that monetary policy in the long run influences prices, but not output and employment developments. Recent work corroborates this long run linkage (Christiano *et al.*, 1999).

Recent scholarly works discount the stable money demand assumption of monetarism which tends to become unstable in the epoch of rapid financial and technological innovations (White, 2013). According to Tobin (1970), the monetarist impact on output found in the empirical work of Friedman and Schwartz (1963b) can be re-inferred as output innovations leading to changes in money growth. The assumption long-run neutrality has faced contestation in recent works. For example Evans (1996) finds that money is not neutral in the long run if it is not in the short run, in particular if the growth is endogenous. If growth is exogenous, long run neutrality is found.

5.2.4 NeoClassical Growth Theory

The widely acclaimed growth model is coined after the works of Solow (1956) and Swan (1956) to the extent that it is often referred to as "the neoclassical growth model". Solow growth model has its roots in the Harrod Domar Model, an early post-Keynesian growth that dominated the 1940s and stipulated that shows that economic growth rate equals the rate of investment multiplied by the reciprocal of the capital—output ratio. When the capital-output ratio is assumed constant, investment becomes the determinant of growth (Domar 1946; Solow, 1956). The Harrod Domar assumption of production taking place under conditions of fixed proportions was challenged by Solow (1956) and introduced the substitution between labor and capital, in order to eliminate the knife-edge path of equilibrium.

The Solow (1956) and Swan (1956) neoclassical growth theory underscores three main drivers of growth respectively labor, technological progress in the long run and capital accumulation in the short run. Capital accumulation is believed to be leveraged by savings. The model excludes money and the real factors of labour, capital and technology determine real interest rates. The theoretical view that monetary policy has no or limited impact on growth is substantially found in scholarly works that argue that monetary policy mainly works through savings and thereby influencing capital accumulation. However, the effect of monetary policy on capital accumulation and growth remains only a short run phenomena and minimal.

Exogenous technical progress plays a dominant role in influencing growth (Solow, 1957).

Tobin (1965) attempted to modify the Solow and Swan model by introducing money. The assumption was that money was not the only store of value but additionally physical capital was and the two were considered substitutes. This suggests that an increase in money supply would result into higher inflation and lower real interest rates. The lower real interest rates would increase the demand for physical capital (since it is a substitute to money) and higher capital intensity would bolster higher output (Tobin, 1965). With the integration with short-run factors such as wage and price rigidity and portfolio balance requirements into the long-run determination of output, he rejected the long-term monetary super neutrality as stipulated in classical theory and argues that capital intensity, output and the equilibrium interest rate are affected by monetary supplies and portfolio behavior among other factors (technology and thrift) highlighted in neo Classical growth theory (Tobin, 1965; 1970). However, the Tobin's monetary growth theory did not gain traction in contemporary literature (Dimand and Darlauf, 2009).

The two decades after 1960s saw the emergence of endogenous growth models where the factor productivity element was mainstreamed into the Solow growth model. The assumption of constant returns to scale was introduced. The productivity of labour and capital were considered as engines of growth and self-reinforcing. The absence of labour or its productivity would impede productivity of capital (Romer, 1989; Rebelo, 1987).

5.2.5 New Classical Model

The advent of the New Classical Model in the 1970s is premised on the Robert Lucas's monetary equilibrium business cycle theory and the Kydland and Prescott Real Business Cycle (RBC) theory (Kydland and Prescott, 1982). The former focused on monetary shocks and their impact on macro-economic cycles while the RBC theory was premised on real shocks and their effect on economic cycles (Kydland and Prescott, 1977; Lucas 1987). Unlike the traditional Keynesianism, the two theories placed emphasis on microeconomic assumptions and the idea of

rational expectations and perfect competition in markets (Snowdon and Howard, 2005).

The monetary Lucas business cycle model underscored the importance of stable inflation and the credit worthy monetary policy in guiding public expectations with limited expectation errors, aiding efficacy of monetary changes (Lucas, 1987). Low monetary growth would result into low inflation around natural rate of unemployment as well as output growth (Snowdon and Howard, 2005). In the RBC theory, money has little impact on business cycles. On account of perfect information and competition, economic agents would react in a most favourable manner to real and technological shocks, thereby leading to economic/business cycles. Therefore, economic changes were an optimal representation of economic agents implying that economic (including monetary) policy response to these shocks may be ineffectual and contrary to the stabilization objective (Snowdon and Howard, 2005).

Macroeconomics has since become more micro-founded and the business cycle theories led to the New Classical theory in the late 1970s (Palley, 2007). This theory maintains no wage and nominal rigidities and that there is perfect competition. In classical models, that is, the RBC model and Lucas supply model, prices and wages are completely flexible so that labour and goods markets continually clear. The new classical model underscores that monetary policy has no effect on the real variables. The model also rests on the following tenets: The economic agents are rational, imperfect information prevails, the labour market equilibrium is attained at the natural rate of employment and the perfectly competitive markets continue to clear (Palley, 2007). New Classical (NC) model of monetary policy is described by the following equations⁸;

$$y_t = b_0 + b_1 r_t - b_1 E_{t-1}(p_{t+1} - p_t) + e_{yt} \quad (5.8)$$

$$m_t - p_t = c_0 + c_1 i_t + c_2 y_t + e_{mpt} \quad (5.9)$$

⁸ Lucas aggregate supply equation not included is also often used in the New classical model

$$m_t = d_0 + d_1 m_{t-1} - d_2 m_{t-2} - d_3 y_{t-1} + e_{mt} \quad (5.10)$$

y_t, m_t, p_t are in logarithms of output, nominal quantity of money and the price level where i_t is the nominal rate of interest. e_{yt}, e_{mpt} and e_{mt} are the serially and mutually uncorrelated disturbances. E_{t-1} is the mathematical expectation of the variable on which it operates, conditional on information available at end of period $t - 1$. $b_1, c_1 < 0, d_i, c > 0$ Equation (5.8) is an IS curve equation, equation (5.9) is the LM equation and equation (5.10) is the money supply feedback rule. Monetary policy has no effect on real variables (interest rates, employment, consumption and income) and therefore their equilibrium levels are not guided by it which implies monetary policy neutrality. Monetary policy (anticipated) will have no effect on real GDP according to rational expectations hypothesis and the continuous market clearing assumption. Only monetary policy (unexpected) surprises would have a temporary effect on real variables (Mankiw, 2006).

In the simple model, output and employment fluctuate in response to variations in technology, which is assumed to be the only real driving force. However, optimal monetary policy requires an interest-rate equal to zero, implying a permanent deflation in the steady state (Palley, 2007). The assumptions of continuous market clearing and flexibility of wages, prices and instantaneous adjustment of the economy to its long run equilibrium, were rejected by the New Keynesian theorists (Mankiw, 2006). Many empirical studies also reject the theory (Gottschalk, 2005).

The innovations of introducing the monetary sector in the new classical model while upholding its key assumptions in particular related to perfect competition and no price rigidities in all markets remained futile in scholar and policy work. Goodfriend and King (1997) note that methodologically, the RBC literature insisted on the explicit formulation of individual dynamic optimisation and of preferences and technology.

5.2.6 New Keynesian Model

This theory upholds the long-run neutrality and posits that monetary policy can only affect output in the short run through the nominal interest rates. A contractionary monetary policy (positive change in interest rates) will reduce aggregate demand and output in the short run through its regressive impact on consumption and investment (Palley, 2007). The primary distinction between Keynesian and classical macroeconomics is the flexibility of prices and wages. The integration of sticky prices and monopolistic competition into new classical model became the major distinguishing feature of New Keynesian Economics (Good friend and King, 1997). In this model, nominal rigidities are assumed in both labour and good markets and the key economic agents in goods and labour markets on the supply side (respectively firms and households) are price setters. This also implies that the respective prices in goods and labour markets remain momentarily unresponsive to exogenous shocks including any economic policy. The NKE innovation of inflexible prices and wages to the Calvo (1983) staggered price and wage-setting was attained by adjusting the respective current pricing for past price changes.

New Keynesian economics is based on the traditional Keynesian models but introduces microeconomic fundamentals (Clarida *et al.*, 1999). The first scholarly work on New Keynesian models were modelled on three canonical frameworks (forward looking IS curve, Philips curve and interest rate monetary policy rule). IS curve shows the equilibrium relationship between the output gap and real interest rates, the Phillips curve exhibits the positive nexus between inflation rate and output gap, and the interest rate monetary policy rule shows that interest rate is a function of expected future output gap and expected future inflation. The three equations (IS curve⁹, Phillips curve and monetary policy rule) of the Dynamic New Keynesian (NK) models for closed economy are respectively shown in equation 8, 9 and 10:

$$x_t = -\alpha(i_t - E_t\pi_{t+1}) + E_tx_{t+1} + v_t \quad (5.11)$$

⁹ Unlike the basic Keynesian IS, the New Keynesian IS is forward looking and embeds expected future output.

$$\pi_t = \alpha x_t + \gamma E_t \pi_{t+1} + \mu_t \quad (5.12)$$

$$i_t = i^* + \theta_x E_t x_{t+1} + \theta_\pi E_t \pi_{t+1} + \varepsilon_t \quad (5.13)$$

x_t, π_t and i_t are endogenous variables. x_t is the output gap, π_t is inflation gap as measured as deviation from longrun level and i_t is the nominal interest rate (as measured by deviation from long run level), $i_t - E_t \pi_{t+1}$ is the real interest rate, v_t is the demand shock, μ_t is the cost push shock, $E_t \pi_{t+1}$ is the expected future inflation and ε_t is monetary policy shock

The three equations are derived from the microeconomic fundamentals; the parameters $(\varphi, \alpha, \gamma, \theta_x, \theta_\pi)$ are tied back to economic primitives. $\varphi < 0, \gamma, \theta_x, \theta_\pi$ and $0 < \alpha < 1$.

The canonical Keynesian open economy models have introduced the uncovered interest parity equation (see Equation 5.14) on the assumption that the exchange rate fulfills the uncovered interest condition (Clarida *et al.*, 2001).

$$e_t = d_1 E_t \hat{e}_{t+1} + d_2 (r_t - E_t \pi_{t+1}^*) + d_3 (r_t^* - E_t \pi_t^*) + e_{et} \quad (5.14)$$

where r^* and π_t^* denote the foreign short-term interest rate and inflation rate respectively.

$$0 < d_1, d_2, d_3 < 1$$

The uncovered interest parity equation means that the expected real depreciation is related to the real interest rate differential between the domestic and foreign economies. The world economy consists of the domestic economy which is small and open while the external economy is considered large and closed. Both the domestic and external economies have similar tastes and preferences, technology and the traded consumption goods (Clarida *et al.*, 2001).

The meaningful attempt to merge the new Keynesian model and growth models (the neoclassical or endogenous) was premised on the tenet of inflation volatility having distortive ramifications on economic agents' behavior regarding savings, consumption and investment. This therefore implies that inflation volatility would have dire ramifications on economic growth in the long run. (Gomes, 2006). Empirical evidence on the use of New Keynesian models remains slim, and the practicality of theory is contested in part on grounds of absence of the role of money (Arestis and Sawyer, 2008).

5.2.7 New Consensus Model

The New Consensus Model (NCM) became a product of the New Classical Model and New Keynesian Model; upholding the rational expectations of the former as well as retaining the wage and price short run rigidities of the latter. It also became a foundation of the inflation targeting where price stability was the overriding objective while the other objectives including growth became secondary (Fontana and Palacio-Vera, 2007). Interest rates are also considered the sole monetary policy instrument. The model posits that monetary policy has an impact on output only in the short-run and neutrality on output in the long run. However, monetary policy primary goal in the long run should be price stability. The short-run dynamics are premised on the temporal nominal rigidities but due to rational expectations, the market is able to clear and thus no long run economic activity implications. The output stabilisation is also traced in the NCM aggregate demand curve, where the level of output is inversely related to the real interest rate. This implies short-term rates monetary policy can affect the demand side of the economy, which eventually converges towards the long run supply side equilibrium (Fontana and Palacio-Vera, 2007).

NCM however faces compelling criticism over its assumptions and its practicability. There is limited empirical evidence to back the theory (Chari *et al.*, 2008; Arestis and Sawyer, 2008). The absence of money and exchange rate roles, inadequate treatment of markets (financial, labour and capital markets), the focus on a single instrument and independent Central Banks discounts its operation usefulness particularly for developing countries and open economies (Arestis, 2009; Arestis and Sawyer, 2008; and Fontana and Palacio-Vera, 2007). The NCM may also be inappropriate for economies with persistence of a supply-driven inflation, and so would be its theorised assumption of inflation elasticity into other variables (Arestis and Sawyer, 2008; and Fontana and Palacio-Vera, 2007). The output stabilisation forward looking targeting has been in some recent literature of Woodford (2007).

The underlying rejection of NCM not only ignites the debate on the earlier theories but it also raises consensus crisis on the role of monetary policy on output (Fontana, 2010).

5.3 Monetary Transmission Mechanisms

Various theories have been used to predict the various mechanisms in which monetary policy actions are transmitted into ultimate objectives (output, inflation and employment). This is also defined as monetary transmission mechanisms (Taylor, 1995). The various channels which changes in monetary policy actions have real effects on the economy are: the interest rate channel, asset price channel, exchange rate channel, credit markets channel and the expectations channel (Mishkin, 1995). The expectations channel is central to monetary policy conduct and continues to receive increased focus in the recent scholarly works (Loayza and Schmidt-Hebbel, 2002). Sub sections 5.3.1 to 5.3.5 discuss the different monetary transmission mechanisms

5.3.1 Interest Rate Channel

The underpinning theoretical foundations for the interest rate channel are drawn from the Keynesian theory of interest rates, and subsequently elaborated in the IS-LM-AS

model as well as in the New Keynesian Models (Rotemberg and Woodford, 1997; Clarida *et al.*, 1999). As demonstrated in the IS-LM framework, any variations in interest rates trickles down to other short-term and long-term interest rates influencing the aggregate behaviour of firms and households and consequently leading to changes in aggregate demand and output (Loayza and Schmidt-Hebbel, 2002). The process in which changes in interest rates transmit to output takes into consideration the variations between nominal and real interest rates (inflation), and the spread between short-term and long-term real interest rates. The emphasis in theoretical literature is paid to the real interest rates rather than the nominal interest rates as key determinants of consumption and investment decisions. Imperatively the long-term real interest rates rather than short-term interest rates are believed to significantly impact more on investment and consumption expenditure (Mishkin, 2007b).

The expectations theory of the term structure of interest rates suggests that changes in monetary policy through the short-term nominal interest rates which then influence the long-term real interest rates. A contractionary monetary policy leads to an increase in short-term nominal interest rates, and an increase in due to nominal rigidities of prices in the short-run. The higher real interest rates lead to the downward adjustment of both consumption and investment patterns respectively by households and firms. The savings for future investments become more attractive, credit becomes more expensive and thus a reduction in disposable income of agents (Loayza and Schmidt-Hebbel, 2002). Consumption in part depends on agent's wealth, and the latter decreases through lower asset prices that are negatively associated higher long term interest rates. This therefore fosters a reduction in aggregate demand and inevitably a reduction in output. The reverse is true for an expansionary monetary policy, where real long-term interest rates decrease, fostering consumption and investment and hence higher output growth (Mishkin, 2007b).

This channel works even with the problem of lower zero bound. The expansion in money supply causes the expected price level to increase, despite the nominal interest rate at zero, hence increased expected inflation leads to lower real interest rate and stimulates spending. This channel is hallmark of "*money view*". However, the efficacy of the channel depends on a couple of efficiency elements. These partly

are the structure of the economy including the development of the financial sector and competition within the sector (Mukherjee and Bhattacharya, 2011). A highly developed and competitive financial sector tends to improve the transmission of this channel.

5.3.2 Asset Price Channel

The Keynesian theory and the IS-LM framework consider interest rates as the only asset price, but monetarism theory elaborated in the Friedman's theory of money demand emphasizes the consideration of other asset prices. This includes, among others, exchange rate and equity price channel (Loayza and Schimdt-Hebbel, 2002). Sections 5.3.2.1 and 5.3.2.2 describe the equity price channel and wealth effects channel respectively.

5.3.1.1 5.3.2.1 Equity Price Channel

Tobin's q theory of investment and the wealth effects transmission mechanism are the respective channels that explain how the equity prices increase aggregate demand respectively through net worth of firms and the wealth of consumers.

The q in Tobin's q theory of investment represents the ratio of the market value of fixed capital to its replacement cost. If q is greater than one, then implies a higher market value of fixed capital compared to its replacement costs. On the other side, when q is lower than one, that market value of fixed capital is lower than its replacement cost. An expansionary monetary policy leads to lower interest rates and the asset prices will increase since they are inversely related to interest rates. This makes the firm's investment attractive; eventually the Tobin's q will increase outstripping its replacement cost. This also implies a q that is greater than one which incentivizes the firms to increase capital, inevitably investment, aggregate demand and output (Loayza and Schimdt-Hebbel, 2002). Further, Loayza and Schimdt-Hebbel (2002) notes that contractionary monetary policy actions lead to lower equity prices, making investment less attractive through the lower q impact; ultimately constraining aggregate demand and output.

5.3.2.2 Wealth Effects

This wealth transmission mechanism is built on the Ando and Modigliani (1963) life cycle hypothesis, which underscores that consumption, is dependent on household's life time resources which include stocks as a significant share of one's wealth. As aforementioned, an expansionary monetary policy leads to lower interest rates and higher asset prices. The resultant higher asset valuation implies higher wealth levels (Bank for International Settlements "BIS", 2008). If the households expect the higher asset prices to predominate in the long run, then they will adjustment their consumption upwards fostering higher aggregate demand and output. Similarly, a contractionary monetary policy leads to higher interest rates and lower equity prices - where lower asset valuation leads lower wealth, lower consumption and consequently lower aggregate demand and output (Loayza and Schmidt- Hebbel, 2002).

5.3.3 Exchange Rate Channel

This channel posits that monetary policy actions transmit through equilibrium money market conditions to the exchange rate and ultimately aggregate demand and output. This requires that the uncovered interest rate parity (UIP)¹⁰ conditions hold (Batini *et al.*, 2001). An expansionary monetary policy is associated with lower domestic interest rates, and relative interest rate differential with foreign interest rates leads to an outward looking capital flows. The flight of foreign currency relative to the existing stock of domestic currency leads to the weakening of domestic currency relative to foreign currencies. Capital out flow would prevail until parity between the domestic short term domestic interest rates and the foreign interest rates is restored in tandem with the UIP condition (Mishkin, 2007b).

Owing to the fact the exchange rate is proxy for competitiveness, the weaker domestic currency would imply cheaper exports and expensive imports, which would

¹⁰ The Covered Interest rate Parity (CIP) presents an equilibrium case of no arbitrage exists between domestic and foreign markets. The CIP conditions has been an academic thrust for domestic –foreign economic interactions found in various models namely; Mundell Fleming Model, Dornbush model, and New Keynesian Models.

mean an improving net exports (exports minus imports) position and eventually, aggregate demand and output (Mishkin, 2007b). However, the expensive imports tantamount into an increase in domestic prices which arguably constrain aggregate supply and consequently output (Loayza and Schmidt-Hebbel, 2002). The reverse is true, the monetary contraction translates into higher interest rates, and the resultant favourable interest rate differentials lead to heightened inflow of capital. This would in turn lead to the strengthening of the domestic currency relative to the foreign currency, thereby increasing imports relative to exports (reduced net exports) and resultantly output would decline (Loayza and Schmidt-Hebbel, 2002). Similar transition can be obtained under the fixed exchange rate regime by devaluation and revaluation respectively (Loayza and Schmidt-Hebbel, 2002).

5.3.4 Credit Channel

The classical monetarist view supports the credit channel, with particular emphasis on the quantity of money in determining aggregate demand. It has its foundation in the classical theory of money. An expansionary monetary policy leads to an increase in monetary aggregates which further increases the cash holdings of consumers in their portfolios beyond their desired levels, increasing the aggregate demand and output (Loayza and Schmidt- Hebbel, 2002). However, unregulated increases in money supply would eventually constrain output (Balogun, 2008). This channel predominates in economies with fairly underdeveloped financial markets where equity markets are shallow and illiquid. This means where corporate and private sector entities have alternative liquid sources of financing from equity markets, monetary policy is likely to be inept. The credit channel is comprised of the bank lending and the balance sheet channels (Loayza and Schmidt- Hebbel, 2002). The bank lending channel has prominence when the substitutes to bank credit are limited and not easily accessible. This means firms especially the small and medium entities rely heavily on credit (Coricelli et al., 2006). Further, Loayza and Schmidt-Hebbel (2002) reiterates that this channel works through volume of loans available to the firms and households and emphasizes the role of financial intermediaries (banks) to households and small and medium enterprises.

As aforementioned, an expansionary monetary policy leads to an increase in bank assets in form of loanable funds which further fosters households and firms to adjust upwards their consumption and investment respectively and inevitably espouses output expansion (Mishkin, 2007b). The balance sheet channel fundamental works through monetary actions transmitting through agents' net wealth and the private sector firms' balance sheets. The latter is contingent upon the assumption of imperfect information in the financial sector. With prevalence of information asymmetry on the borrowers, the challenges of moral hazard and adverse selection become more pronounced (Bernanke and Gertler, 1995). This also implies that information asymmetry increases the risk of borrower and a contractionary monetary policy would constrain the borrower's net worth through reduced asset valuation. This would eventually constrain output (Mishkin, 2007b). This in turn leads to a decline in output. On the other side, an expansionary monetary policy would increase the agents' net worth and income and eventually higher output (Loayza and Schmidt-Hebbel, 2002).

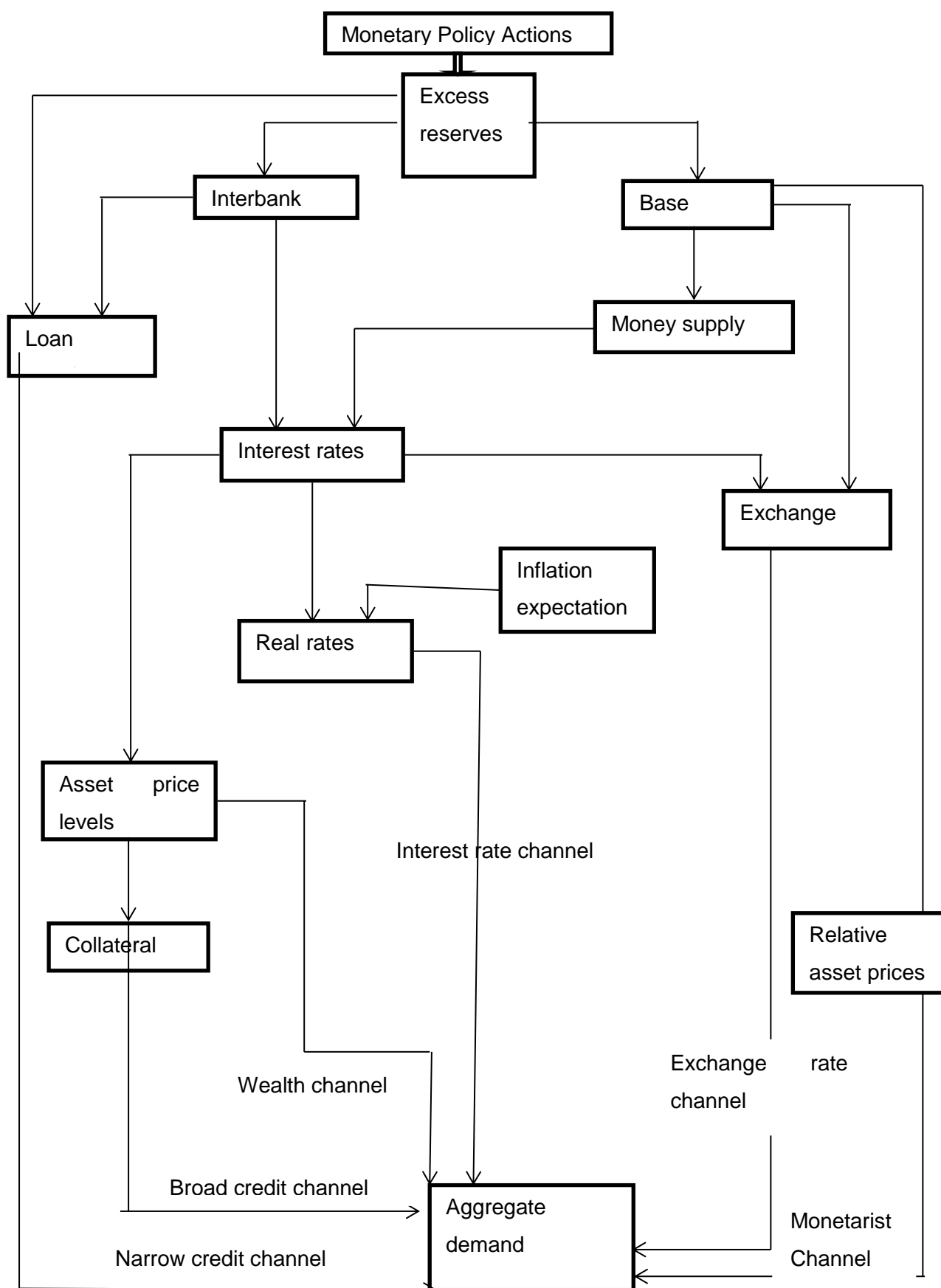
5.3.5 Expectations Channel

The independence of both central bank and monetary policy remain central to the functioning of the expectations transmission mechanism. Therefore, the credibility of the central bank remains ultra-important in this channel and critical in guiding future household consumption and firms' investment behavior (Woodford, 2003). All are determined in a forward looking manner affected by the agents' beliefs about future shocks and the expected monetary authority policy actions (Loayza and Schmidt-Hebbel, 2002). Inflation adjusted domestic interest rates is what tends to guide households and firms on their consumption and investment decisions (Loayza and Schmidt-Hebbel, 2002). Three main forms of expectations exist; adaptive expectations posit that agents' future expectations are underpinned by past monetary policy stance, extrapolative expectations are contingent upon extrapolated observed current and past values of monetary actions however, extrapolated future values are not necessarily rational. Rational expectations are underpinned by rational information from the current and past economic performance and monetary policy stance (BIS, 2008).

Rational expectations have gained prominence in theoretical models and central to conventional monetary policy conduct (Boivin *et al.*, 2010). With credible and independent central bank, monetary policy actions will be effective in reach the desired stabilization goals. The past economic trends and current monetary policy actions tend to guide future investment and consumption patterns. A contractionary monetary policy result into higher short-term interest rates and real interest rates, thereby feeding into rational agents' decisions of downward revision of their consumption and investment patterns – inevitably constraining output (Loayza and Schmidt-Hebbel, 2002). In the New Keynesian models, Clarida *et al.*, (1999) argues that credibility of central bank allows monetary policy to face an improved trade-off between stabilizing inflation and output, reducing the sacrifice ratio of inflation stabilization. The notion of rational expectations has garnered criticism in contemporary scholarly work (Rudd and Whelan, 2006; Capistrano and Timmermann, 2009).

In conclusion, the five channels described in this section can occur concurrently and be self-reinforcing. In recent scholarly works by Bordon and Weber (2010) and Mishra *et al.* (2012) they indicate that the strength, speed and efficacy of the different MTMs depends on a number of factors, *inter alia*: The depth and width of the financial sector; the strength and extent of the linkages with global financial markets; the independence of the central bank; the composition of the financial sector; the degree of dollarisation; competitiveness of the banking sector, the flexibility of the exchange rate; the monetary policy regime and the coordination of the fiscal and monetary policies. Economies with small and concentrated private bank-dominated financial systems, a large informal financial sector, weakly competitive financial sector, shallow and illiquid capital markets, short-yield curves, heightened dollarisation and fiscal dominance tend to have weak MTMs. Strong institutional and regulatory environment tends to espouse the independence and credibility of the central bank which is essential for effective transmission of monetary policy actions into its ultimate objectives (Mishra *et al.*, 2010). Figure 5.1 presents the different monetary transmission mechanisms.

Figure 5.1: Monetary Transmission Mechanisms



5.4 Monetary Policy and Economic Growth: A Review of Empirical Literature

Asongu (2014) investigated the long-run neutrality of monetary policy in 34 African countries over 31 annual data series spanning from 1980 to 2010 using Engle-Granger based Pedroni and Kao cointegration tests. The results confirmed long-run neutrality of money consistent with a number of recent scholarly works (Bullard, 1999; Nogueira, 2009).

Sturgill (2014) investigated the relationship between money growth and economic growth in 15 of the 21 Organization for Economic Cooperation and Development (OECD) countries over the 1979-1997 period using Ordinary Least Squares (OLS). The results confirmed a positive nexus between nominal money growth and economic growth, particularly in nations with well-developed institutions.

Opolot *et al.* (2013) investigated monetary policy transmission mechanism in Uganda using recursive and non-recursive VAR on monthly data for the period July 1997 to December 2012. Their results indicate that a positive shock in base money (expansionary monetary policy) resulted in an increase in output.

Ivrendi and Yildirim (2013) investigated the nexus between monetary policy shocks and macroeconomic variables in Brazil, Russia, India, China, South Africa and Turkey using Structural VAR(S-VAR) model on monthly data spanning from 1995 to 2012. However, China and Russia monthly data series spanned from 1999 to 2012 and 1997 to 2012 respectively. Their results indicate that contractionary monetary policy shocks have negative effects on output in India, South Africa, Russia and China in the short run and insignificant effect in Brazil and Turkey.

Fernald *et al.*, (2013) estimated a Factor-Augmented VAR (FAVAR) for monthly sample spanning from January 2000 and ending in September 2013 for China. The study used five measures of monetary policy for China, namely: a benchmark short-term (less than 20 day) interest rate set by the Peoples' Bank of China (PBOC); a longer-term rate (6 months or less) for loans from the PBOC; the reserve-requirement

ratio; the money supply, as measured by M2; and the quantity of bank lending. The main finding is that a positive shock to the policy interest rates and reserve requirements has a negative effect on economic activity while monetary aggregates (M2) and bank lending are found to have an insignificant impact on the economic activity.

Barakchian and Crowe (2013), using new evidence from new shocks data, investigated whether monetary policy matters for economic growth. They developed a new shock measure that uses factors extracted from Federal (Fed) Funds futures to measure exogenous changes in policy. Incorporating the shock series in the three variables VAR for monthly series 235 series spanning from December 1988, they found that a contractionary monetary policy shock has a statistically significant negative effect on output, with maximum effect coming two years after the monetary contraction.

Berg *et al.* (2013) applied the Romer and Romer (1989) narrative approach to examine MTMs in the tropics with a focus on four East African countries (Uganda, Kenya, Tanzania and Rwanda). They found that sizeable monetary policy increases in the short-term interest rate constrained economic growth, mainly in Kenya and Uganda that operated some form of policy rate based monetary policy regimes. The results were less impressive and muted in Tanzania and Rwanda respectively due to the type of monetary regime and exchange rate regime. Tanzania operated a monetary targeting regime while Rwanda's exchange rate regime was less flexible. In Tanzania, monetary policy only had a limited impact on output mainly through the credit channel.

Davoodi *et al.*, (2013) investigated MTMs in the East African community (Burundi, Kenya, Rwanda, Tanzania and Uganda) using VAR methodology (Recursive VARs, Bayesian, and Factor VARs) on a total of total of 115 monthly observations spanning from January 2000. The results revealed that expansionary monetary policy shocks increased output. The positive shocks to money had a positive effect on output in Burundi, Rwanda and Uganda. Similarly an expansionary monetary policy through shocks on short term interest rate shocks increased output in Burundi, Kenya and Rwanda.

Using VAR methodology, Montiel (2013) estimated the strength of MTMS in Uganda on a total of 115 monthly observations spanning from December 2001. Montiel's findings indicated that an expansionary monetary policy initially leads to an expansion of real economic activity but this effect dissipates quickly, and actually becomes consistently negative after about 10 months. The study found that monetary policy had muted impact on economic activity and output.

Montiel *et al.*, (2012) estimated the MTMs in Tanzania using both recursive and structural VAR. Three and six variable VARs were applied on monthly data from January 2002 to September 2010. In the six variables VAR – exchange rate, broad money, reserve money, loan rate, price level, and output – all in log levels were used while in the three variables VAR, only exchange rate, reserve money, and price level were used. Their empirical results reveal monetary policy neutrality on output when monetary policy does not influence output.

Chaudhry *et al.*, (2012) applied the Johansen-Juselius cointegration test to examine the linkage between monetary policy, inflation and economic growth in Pakistan both in the short run and in the long run on 28 annual observations ending in 2010. The results stressed that budget deficit, real exchange rate and money supply had positive effect on real GDP in Pakistan in the long run while both credit to private sector and interest rate had a negative effect on real GDP. Consumer price index was found to be insignificant. The respective variables were found to be insignificant in the short run.

Relying on the Bayesian approach on United States America data from quarter one 1960 to quarter one 2009, Milani and Treadwell (2012) estimated a small-scale Dynamic Stochastic General Equilibrium (DSGE) model in a bid to determine the effects of unanticipated and anticipated monetary policy shocks. Output gap, inflation, and the federal funds rate were used as manifest variables. The results revealed that the unanticipated (surprise) monetary policy shocks have a smaller and more short-lived impact on output, while the anticipated policy shocks or news had sizeable and permanent effect. While anticipated monetary policy shocks was relatively stronger in influencing economic activity than the surprise monetary policy shocks, the overall monetary policy impact on output remained limited.

Mugume (2011) used five variables non-recursive VAR to estimate Uganda's quarterly data from the first 1999 to the first quarter 2009. The five variables used were real GDP, CPI, broad money, three-month T-bill rate (lending rate), nominal exchange rate, and credit to private sector. All variables were in first difference of log except for interest rate, which was in levels. A shock to interest rate (91 day T-bill rate) was considered as the monetary shock and he found that a contractionary monetary policy drives output down. The output effect was significant, lasting up to two quarters, while innovations in M2 had no statistically significant effect on output. The findings also reveal that the interest rate, credit, and exchange rate channels were weak.

Moursi and El Mossallamy (2010) analysed monetary policy in Egypt and its effect on inflation and growth by using the Bayesian approach to estimate a DSGE model for a small closed economy. Monthly time series data for the sample period 2002 to 2008 were utilised. Four different versions of the new Keynesian DSGE model were examined, applying different forward- and backward-looking assumptions about the formulation of price and wage expectations including Calvo-type sticky prices, wage staggering and price and wage indexation. They found that the impact of the monetary policy negative shock is relatively more significant on output than on inflation indicating that expansionary monetary policy is capable of stimulating economic growth without imposing too much pressure on prices.

Maturu *et al.* (2010) applied both recursive and non-recursive SVAR to investigate MTM in Kenya using quarterly data from 2000 and 2010. The study reveals that an expansionary monetary policy (a positive shock on M3), has no effect on real output.

Buigut (2009) assessed the importance and similarity of the interest channel for EAC countries using VAR model and also tested the appropriateness of a vector error correction model (VECM) relative to Vector Auto Regression (VAR) for use in assessing the similarity of transmission mechanism in the EAC (Uganda, Kenya and Tanzania). The annual data on three variables (real GDP, CPI and Interest rates) used in different countries varied; Uganda (1984 to 2005), Kenya (1984 to 2006) and Tanzania (1984 to 2005). The results confirm that no co-integration among the variables was found. The findings also reveal that the interest rate transmission mechanism was weak in all three countries and that a shock to the interest rate had

no statistically significant effect on real output. The reasons for weak interest rate channel could be attributed to the underdeveloped financial markets in the region.

Amarasekara (2009) assessed the effects of monetary policy on economic growth and inflation in the small open developing economy of Sri Lanka. Using both recursive VAR and semi-structural VAR methodology developed by Bernanke and Mihov (1995) on monthly data for the period from 1978 to 2005, the study analysed the effects of interest rate, money growth and the movements in nominal exchange rate on real GDP growth and inflation. Bernanke and Mihov methodology was also used in the derivation of a monetary policy index for Sri Lanka. The results from recursive VAR found that positive innovations on interest rates decreased GDP growth, while the impact of money growth and exchange rate on GDP growth when used as policy indicators, contrast with established theory. The recursive results are consistent with results from the semi structural VAR. The monetary index displays that unanticipated monetary policy formed a smaller portion of monetary policy action in comparison to anticipated monetary policy and that decline in GDP growth is associated with anticipated policy with a short lag.

Rafiq and Mallick (2008) examined the effects of monetary policy shocks on output in the three largest euro area economies – Germany, France and Italy (EMU3) – by applying a new VAR identification procedure. Their findings reveal that a contractionary monetary policy leads to a fall in output in France and Germany, except in the case of Italy where an output puzzle is established. The results also confirmed long-run monetary neutrality for all countries. They concluded that monetary policy innovations play, at most, a modest role in generating fluctuations in output for the EMU3.

Smets and Wouters, (2007) developed and estimated a DSGE model with sticky prices and wages for the euro area. The model was estimated with Bayesian techniques using seven key macroeconomic variables: GDP, consumption, investment, prices, real wages, employment, and the nominal interest rate. In addition, they introduced ten orthogonal structural shocks (including productivity, labor supply, investment, preference, cost-push, and monetary policy shocks) that allowed for an empirical investigation of the effects of such shocks and of their contribution to business cycle fluctuations in the euro area. They found that the

labour supply and the monetary policy shock are the two most important structural shocks driving variations in euro area output.

Dele (2007) examined the monetary and macroeconomic stability perspective of West African Monetary Zone Countries using quarterly data sample spanning first quarter 1991 to fourth quarter 2004. The regression results indicated that monetary policy, as captured by money supply and credit to government, hurts the real domestic output of these countries. The study also shows that interest rates policy had adverse effects on GDP, contrary to the theoretical expectation of an inverse relationship; and that exchange rate devaluations have no effect on output.

Dickinson and Liu (2007) examine the real effects of monetary policy in China using Unrestricted VAR and impulse response functions over the 1984-2005 sample period. They used two monetary policy variables (Central bank loans and total credit) independently and found that Central bank lending rate was not a significant policy instrument in the short run but had a positive and stronger effect on output in the latter period (after 1989). Total credit had smaller and less persistent effects on output in the long term.

Using a five variable VAR, Starr (2005) empirically investigates the real effects of monetary policy in Russia, Ukraine, Balarus, and Kazakstan for quarterly data from quarter one 1995 to last quarter in 2003. Money supply, interest rates and exchange rate used as monetary policy variables. The results confirm that money supply and exchange rate policy variables had no significant effect on output. Interest rates had only a negative significant effect on output only in Russia.

Kim (1999), using an identified VAR model that identifies monetary policy actions for G7 countries, examined the effects of monetary policy shocks in the post war period. The estimation monthly periods were March 1965 to May 1997 for Germany; March 1965 to June 1996 for Japan; March 1961 to March 1997 for the U.S.; March 1961 to March 1994 for the U.K.; March 1965 to June 1996 for France; March 1965 to January 1997 for Italy; and March 1965 to March 1997 for Canada. The findings indicate that positive monetary policy shocks have significant effects on output in short run in tandem with economic theory but monetary policy shocks account for relatively small variations in output- thus the rejection a monetarist view

Bernanke and Mihov (1998) employed a semi structural VAR for measuring innovations in monetary policy and their macroeconomic effects. Using three policy variables (total bank reserves, non-borrowed reserves and the federal funds rate); their results confirm that an expansionary monetary policy shock increases output, with impact reaching the peak in 18 months. Table 5.1 provides a summary of the empirical literature reviewed on the impact of monetary policy on economic growth.

Table 5.1: Empirical Literature Review on the Impact of Monetary Policy on Economic Growth

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
Asongu, (2014)	A note on the long-run neutrality of monetary policy: new empirics	34 African countries	Money supply (M2), liquid liabilities, bank credit on bank deposits, financial system credit on financial system deposits, private domestic credit by deposit banks, and other financial institutions, real GDP.	Engle-Granger based Pedroni and Engle-Granger based Kao cointegration tests	Long-run neutrality of money
Sturgill (2014)	Money growth and economic growth in developed nations	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Italy, Japan, the Netherlands, Norway, Portugal, Spain, United Kingdom, and United States.	Money plus quasi-money, real GDP per worker, annual average ratio of gross fixed capital formation to GDP, the growth rate of the labour force, depreciation rate of physical capital and technology growth rate.	OLS	A positive impact between money supply and economic growth
Vinayagathan (2013)	Monetary policy and the real economy: A structural VAR approach for Sri Lanka	Sri Lanka	World oil price index, foreign IR(federal funds rate),real GDP, domestic CPI, Interest rate(Inter-bank call money market rate), money(Reserve money) and exchange rate	Structural VAR model	A positive shock to interest rates reduced output and a positive money supply shock also reduced output
Davoodi <i>et al.</i> (2013)	Monetary transmission mechanism in the East African Community: An empirical	Burundi, Kenya, Rwanda, Tanzania, and Uganda	Endogenous variables; real GDP, CPI, reserve money, short-term interest rate, credit to private sector, and the nominal effective exchange rate. The exogenous variables; global oil price index, a	Structural VAR, Bayesian VAR and Factor-Augmented VAR	A positive shock to reserve money increases output in Burundi, Rwanda and Uganda. A

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
	investigation		global food price index, U.S. federal funds rate, and U.S. industrial production.		negative shock to policy rate increases output in Burundi, Kenya and Rwanda.
Berg <i>et al.</i> (2013)	The monetary transmission mechanism in the Tropics: A narrative approach	Uganda, Kenya, Tanzania and Rwanda	Inflation (core and headline), nominal exchange rate index, real interbank rate, output gap	Narrative approach, following Romer and Romer (1989). Event study, with a major focus on large shifts in monetary policy.	A large policy-induced rise in the short-term interest rate reduced economic growth in Kenya and Uganda.
Opolot <i>et al.</i> (2013)	Financial architecture and monetary policy transmission mechanism in Uganda	Uganda	Base money, core CPI, composite index of economic activity, exchange rate, private sector credit and the 91-day Treasury bill rate as endogenous variables, and world food price index and the energy price index.	VAR	A positive shock in base money resulted in an increase in output.
Barakchian and Crowe (2013)	Monetary policy matters: Evidence from new shocks data	US	Industrial production, consumer prices and Fed Funds futures-based shock measure,	VAR(incorporating new measures of shocks)	Contractionary monetary policy negative effect on output
Ivrendi and Yildirim (2013)	Monetary Policy Shocks and macroeconomic	Brazil, Russia, India, China, South Africa and Turkey	Money, Treasury bill rates, exports ,imports, consumer price index, producer price index,	SVAR	Contractionary monetary policy shocks have

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
	variables: Evidence from fast growing emerging economies		advanced economies industrial production index, advanced economies consumer price index, the world interest rate, oil prices and the real effective exchange rates.		negative effect on output in India, S. Africa, Russia and China in the short-run and no significant effect in Brazil and Turkey.
Montiel (2013)	Monetary transmission mechanism in Uganda	Uganda	Exchange rate, consumer price index, real imports, and monetary base, bank loan rate.	VAR	Little evidence of monetary policy impact on aggregate demand.
Fernald <i>et al.</i> (2013)	Monetary and fiscal policy effectiveness in China: Evidence from a FAVAR model	China	<p>Five measures of monetary policy for China: a benchmark short-term (less than 20 day) interest rate set by the PBOC; a longer-term rate (6 months or less) for loans from the PBOC; the reserve-requirement ratio; the money supply, as measured by M2; and the quantity of bank lending</p> <p>Two economic activity factors; Broad and narrow series. Broad activity includes a set of 29 indicators while narrow is premised on 3 indicators.</p> <p>A price factor drawing from 4 CPI</p>	Factor-Augmented VAR	A positive shock to the policy interest rate and reserve requirements has negative effect on economic activity while monetary aggregates (M2) and bank lending are not important for the economic activity.

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
			measures and 2 producer		
Montiel <i>et al.</i> (2012)	Financial architecture and the monetary transmission mechanism in Tanzania	Tanzania	Nominal exchange rate, CPI, base money, broad money, a measure of real economic activity, and the bank lending rate	Recursive and structural VAR	Monetary policy had no output effects.
Milani and Treadwell (2012)	The effects of monetary policy news and surprises	USA	Output gap, inflation, and the federal funds rate	Likelihood-based Bayesian methods (DSGE model)	News shocks play a larger role in influencing the business cycle than unanticipated policy shocks.
Chaudhry <i>et al.</i> (2012)	Monetary policy, inflation and economic growth in Pakistan: exploring the co-integration and causality relationships	Pakistan	Real GDP, money and quasi money as a % of GDP, domestic credit to private sector as % of GDP, call money rate, CPI, RER, budget deficit as a % of GDP.	Johansen-Juselius co-integration technique and Error Correction Model	Positive impact of credit to the private sector and call money on economic growth in long run but not in the short run.
Mugume (2011)	Monetary transmission mechanisms in Uganda.	Uganda	Real GDP, CPI, broad money aggregate M2, three months treasury bill rate, nominal exchange rate, credit to private sector, weighted average lending interest rate.	Non-recursive VAR on quarterly data	A negative shock to the 91-day T-bill rate increased output. No effect of broad money M2 on output
Moursi and El Mossallamy (2010)	Monetary policy analysis with New Keynesian Models for Egypt	Egypt	Output (real GDP), CPI inflation and the nominal CBE overnight interbank interest rate	Bayesian approach to a dynamic	An expansionary monetary policy stimulates economic growth

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
				stochastic general equilibrium (DSGE) model	
Amarasekara (2009)	The impact of monetary policy on economic growth and inflation in Sri Lanka	Sri Lanka	Reserve money, interbank call-money market rate, exchange rate, real gross domestic product (GDP) and consumer price level (CPI)	Recursive VAR and semi-structural VAR methodology	A negative interest rate on growth. Money growth and exchange rate impact on GDP growth contrast the established theory
Buigut (2009)	Monetary policy transmission mechanism: Implications for the proposed East African Community (EAC) monetary union.	Uganda, Kenya and Tanzania	Real GDP, CPI ,reserve money and Treasury bill rate	Recursive VAR	Interest rate has no effect on output in all countries.
Rafiq and Mallick (2008)	The effect of monetary policy on output in EMU3: A sign restriction approach	Germany, France and Italy	GDP, GDP deflator, CPI, interest rate, Money and exchange rate	A sign restriction VAR	Contractionary monetary policy leads to a fall in output in France and Germany, except in the case of Italy where an output puzzle is established. Long-run

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
					Monetary neutrality is found for all countries.
Dele (2007)	Monetary policy and economic performance of West African monetary zone countries	Gambia, Ghana, Guinea, Nigeria, Sierra Leone	GDP, money supply (M2), minimum rediscount rate, banking system credit to private sector, banking system credit to central government and exchange rate of the national currency to the US dollar.	Single equation regression analysis	Interest rate had adverse effects on GDP and that exchange rate devaluations had no effect on output
Dickinson and Liu (2007)	The real effects of monetary policy in China: An empirical analysis	China	Output, price, monetary policy variable, total deposits. Interest on central bank loans and total credit are independently allocated as the monetary policy variables.	Unrestricted VAR and impulse response functions	Central bank lending rate had a positive and stronger effect on output in long run.
Smets and Wouters, (2007)	Shocks and frictions In us business cycles	Euro Area	GDP, consumption, investment, prices, real wages, employment, and the nominal interest rate	DSGE Bayesian technique	Monetary policy shocks lead to a rise in the nominal and real interest rate, and to a hump-shaped fall in output the output effects however are much smaller.
Khabo and Harmse (2005)	The impact of monetary policy on economic growth in a small and open economy: case of	South Africa	GDP, money supply(M3) and CPI	OLS	Money supply (M3) has a positive effect on economic growth

Author(s)	Title	Region/Country	Variables	Methodology	Main Findings
	South Africa				
Starr (2005)	Does money matter in the CIS? Effects of monetary policy on output and prices.	Russia, Ukraine, Balarus and Kazakstan	Money supply, interest rate and exchange rate used as policy variables. RGDP and CPI are also included.	VAR	Monetary policy has no effect on output except for Russia, where interest rate has a negative effect on output.
Kim (1999)	Do monetary policy shocks matter in the G-7 countries? Using common identifying assumptions about monetary policy across countries	Germany, US, Canada, Japan, , Italy, U.K. and France	Call money rate, monetary aggregate(M1 or M2), consumer price index, industrial production, and world export commodity price index	An Identified VAR	Rejection of a monetarist view
Bullard (1999)	Testing long- run monetary neutrality propositions: Lessons from the recent research	Various in tandem with literature review scope	Monetary aggregates and real output	A review	Supporting literature for long-run neutrality of money.
Bernanke and Mihov (1998).	Measuring monetary policy	US	Total bank reserves, non-borrowed reserves and the federal funds rate. Real GDP, the GDP deflator, and the Dow-Jones index of spot commodity prices.	Semi-structural VAR	Expansionary monetary policy shock increases output.

5.5 Conclusion

This chapter has explored both theoretical and empirical literature on the relationship between monetary policy and economic growth. The overview of how monetary policy transmits into the economy or least economic growth has been provided. Despite the rapid evolution of monetary policy theory, the stabilisation and the long-run growth impact of monetary policy has remained controversial in contemporary theories. The review has revealed that the nature of transmission, speed and strength of the impact of monetary policy varies across different nations. This is in part explained by the different monetary instruments, size and financial sector deepening, competition with the financial sector, the monetary and exchange rate regimes, openness of the respective economies, the data sets and methodology used. Existing literature has largely focused on quantity-based monetary policy and economic growth, particularly on the long-run impact. The literature on price-based monetary policy impact on economic growth remains unclear. The low income countries' recent empirical studies largely revealed weak transmission mechanisms and no or limited impact of monetary policy on output. Methodologically VAR methodology has dominantly been used, but it remains an open question on the appropriateness for LIC research environment even with presence of valid identification. Further, some of the studies relied on small data observations and thus fewer degrees of freedoms to provide reliable results.

CHAPTER SIX

6. ESTIMATION TECHNIQUES AND EMPIRICAL MODEL SPECIFICATION

6.1 Introduction

This chapter presents the empirical model as well as the associated estimation techniques utilised in this study to test the impact of monetary policy on economic growth in the three study countries (Uganda, Kenya and Tanzania). The chapter is divided into five sections. Section 6.2 covers empirical model specification well as the both the theoretical and the empirical underpinnings of the specified model. Section 6.3 discusses the estimation techniques while Section 6.4 covers data sources and definition of variables. Section 6.5 concludes the chapter.

6.2 Empirical Model Specification

The dynamic impact of monetary policy on economic growth is examined using the autoregressive distributed lag (ARDL) bounds testing approach to cointegration analysis. In literature, a wide range of variables have been found to have an impact on economic growth. As such, the specification of the empirical model is premised on the theoretical links between monetary policy and the growth of the real sector, as discussed under economic growth theories in the previous chapter. The economic growth theories namely; the aggregate production function, Solow growth models, endogenous growth models, Keynesian IS-LM, new classical and new Keynesian theories suggest that there are several variables that influence economic growth.

The primary drivers of economic growth as exhibited by the traditional production functions are labor and capital. The new growth theories endogenise the factor productivity variable, by including endogenous factors to be key drivers of economic growth (Romer, 1994). Endogenous growth theories, on the other hand, provide an

explanation of sustained productivity and output growth. The endogenous approach links permanent changes in certain policy variables to permanent changes in economic growth rates. The endogenous factors used in the empirical model are monetary policy variables of short-term interest rate and money supply as well as inflation, trade openness and exchange rate. Section 6.2.1 discusses the theoretical and empirical underpinnings of the model while Section 6.2.2 presents the empirical model.

6.2.1 Theoretical and Empirical Underpinnings of the Model

Economic growth is defined as the increase in the amount of goods and services produced by an economy over time. It is commonly proxied by various measures in literature and the commonly used ones are industrial production index, total factor productivity, real gross domestic product (RGDP) per capita and real GDP. While RGDP per capita has the advantage of capturing the split of GDP to the population, due to the envisaged limitation of population data, this study adopts RGDP as a measure of economic growth. However, if macroeconomic policies affect the long-run economic growth, the growth rate of real GDP may be a better variable, since policy-makers respond to changes in real GDP or the growth rate of real GDP rather than per capita growth rates. In addition the use of RGDP to proxy economic growth is standard practice in literature (Nogueira, 2009; Davoodi *et al.*, 2013; Asongu, 2014). Real GDP has considerably been used in monetary literature along with other macroeconomic non-policy and policy variables (Amarasekara, 2009; Bagliano and Favero, 1998; Bernanke and Mihov, 1998).

It is enshrined in both theoretical and empirical literature that monetary policy impacts economic growth through various transmission mechanisms. While the monetary policy regimes in the three EAC countries examined in this study were largely monetary targeting for most of the sample period of the study, they are increasingly on transition to either combining elements of different policy frameworks such as inflation targeting and monetary targeting, or explicitly to interest rate based monetary policy (Berg *et al.*, 2013; Davoodi *et al.*, 2013).

Monetary policy is concerned with the changes in the supply of money and short-term interest rate in a bid to attain the set out objectives. The key monetary policy variables used in the many studies are money supply and short-term interest rate - the latter largely for developing economies. This study adopts both on grounds of extensive use in empirical studies (Ivrendi and Yildirim, 2013; Bernanke *et al.*, 2005; Christiano *et al.*, 1999). The adoption of interest rate is also consistent with the new keynesian framework and Inflation targeting regime (Mishkin and Schmidt-Hebbel, 2001; Clarida *et al.*, 1999). Money supply choice is attributed to the fact that monetary targeting regime has been a dominant policy stance over the period under study. In addition the three East African economies have increasingly adopted the short term interest rate as an intermediate target or least the policy rate as an operational target (Berg *et al.*, 2013; Davoodi *et al.*, 2013). Money supply is also common practice in literature (Walsh, 2003).

Short-term interest rate is in part influenced by the central bank policy rates in EAC (Berg *et al.*, 2013). Thus this study uses the short-term Treasury bill rate as a proxy of the market's short-term interest rate, as had been used in recent studies (Berg *et al.*, 2013; Ivrendi and Yildirim, 2013; Buigut, 2010). As in the case with many developing countries, the financial instruments such as stocks and bonds are not well developed in the EAC countries. This implies that a representative of their interest rates cannot be used in the estimation process. In addition, the Treasury bill rates have a longer time series than other representative rates in the three economies. According to economic theory, the lower the Treasury bill rates, the higher the expected level of output. The negative relationship is expected to be statistically significant.

The use of money supply as a monetary policy variable dates far back to works of monetarist theories of the 1950s and 1960s. The use of monetary aggregates variable is consistent with the Reserve Monetary Programmes (RMP) adopted by the three EAC countries in the early 1990s and since then, monetary targeting has been a dominant policy stance (Davoodi *et al.*, 2013). Money supply is the total amount of money available in an economy at a particular point of time and mainly classified as narrow money (M1) or broad money (M2 and M3). Money supply (M3) which is defined as the

component of money comprising of currency in circulation, demand deposits, and time and savings deposits, certificate of deposits liabilities of non-bank financial institutions has been an intermediate target for two of the three countries. Data for most of the sample period on foreign currency deposits is lacking. Therefore this study adopts the M2 which has also been used as a monetary policy variable in empirical literature (Mugume, 2011; Fernald *et al.*, 2013; Asongu, 2014). An expansionary monetary policy informs of increased money supply is expected to be associated with higher levels of output.

In addition to the real GDP growth rate (RGDP) and monetary policy variables (money supply and short-term interest rate), four other variables have been introduced in the model to fully specify the model. These variables are capital stock, exchange rate, trade openness and inflation.

Capital is one of the key determinants of economic growth drawing from the early growth theories. It is defined as any manufactured asset that is applied in production such as machinery, buildings, and vehicles. Capital stock is proxied by the real value of gross fixed capital formation (GFCF) and has been used extensively in empirical studies (see Fosu and Magnus, 2006; Mansouri, 2005 and Kohpaiboon, 2004). Capital accumulation is expected to have a positive and significant relationship with economic growth.

Stable inflation is recognised as an integral component of sound macroeconomic policies within the respective countries. It is extensively stressed in growth literature that inflation affects economic growth (Yilmazkuday, 2013; Pollin and Zhu 2006; Fischer, 2005; Khan and Senhadji, 2001; Bagliano and Favero, 1998). The coefficient of the term representing the rate of inflation is expected to be ambiguous, that is, either negative or positive but high Inflation is believed to affect productivity through its negative impact on savings and investment. Its volatility heightens the unpredictability of real interest rates and eventually affecting investment decisions. Inflation is included as a proxy for macro-economic stability (Akinlo, 2005). It also in part accounts for the supply shocks, since these are dominant in the inflation composition (Berg *et al.*, 2013).

Inflation in all the three countries is measured by the Consumer Price Index and has been extensively used as a proxy in literature (Yilmazkuday 2013; Pollin and Zhu 2006; Fischer, 2005).

The exchange rate is generally considered as a proxy for a country's external competitiveness particularly for the small open economies under study. The real exchange rate defined as the relative price of tradables to non- tradables plays a more fundamental role in the growth process and is reflective of the country's balance of payments, especially the international relationships of both finance and trade (Barro, 2003; Rodrik, 2008). In this study, the standard theory and empirical evidence support the notion that changes in the real exchange rate affect imports and exports, therefore impacting the country's GDP through the external trade (Haddad and Pancaro, 2010; Rodrik, 2008). This study uses the real exchange rate (RER) and has garnered ground in research as a proxy for external competitiveness (Rodrik, 2008). While the findings are inconclusive, the majority support a positive relationship between real exchange rate and economic growth (Haddad and Pancaro, 2010; Rodrik, 2008). An appreciation of the exchange rate (depreciation of the domestic currency) is expected to increase net exports and eventually the country's GDP.

Trade openness definition and measurements have varied considerably in literature. The former, in a narrow sense, has been defined to include only export, import, export taxes or subsidies and explicit non-tariff distortions of trade. On a broader scale, it includes issues such as exchange-rate policies, domestic taxes and subsidies, competition and other regulatory policies, education policies, the nature of the legal system, the form of government, and the general nature of institutions and culture. Different measures have been used for trade openness in recent literature including trade; trade volumes and trade barriers. They have been used as proxies (Monojitet *et al.*, 2013; Sakyi, 2011; Harrison, 1996). Some commonly used proxies are the percentage of exports to GDP, import to GDP and the sum of exports and imports to GDP (Sakyi, 2011; Sarkar, 2008). This study used the sum of exports and imports as a percentage of GDP, also used in recent literature (Sakyi, 2011). Theoretical literature

supports the positive relationship between trade openness and economic growth, and the coefficient is expected to be statistically significant.

6.2.2 Empirical Model Specification

This thesis adopts the Neo-Classical production function as basis for empirical model and the aggregate production function (APF), which has been used broadly in econometric studies to estimate growth in many developing countries (Anyanwu, 2014; Fosu and Magnus, 2006; Mansouri, 2005; Mankiw *et al.*, 1992).

The study presents a growth framework consistent with both the Neoclassical and endogenous-growth models: the growth framework being a function of state and control variables. The former two account for initial conditions and belong to the Neoclassical framework; while the latter are endogenous factor productivity variables.

The standard APF to be estimated is represented as;

$$Y_t = A_t K_t^\alpha L_t^\beta \quad (6.1)$$

Where A_t is total factor productivity (TFP), L_t and K_t are the stock of labour and capital respectively. Y_t is the total output in the economy and time is denoted by subscript t . The justification for inclusion of stock of labour and capital rests on the theoretical foundation of the general aggregate production functions. The Solow- Swan model considered them as the only two factors, capital and labour, in the production function. However, this study drops labour force due to the fragmented and informal structure of the labour markets in countries of study. Physical Capital is measured as Gross Fixed Capital Formation.

A_t represents total factor productivity (TFP) which is defined as an increase in output growth that is not caused by factor accumulation and is determined by economic factors (Mansouri, 2005). Thus, TFP may include all those factors which contribute to the generation of output other than labour and capital.

In this study, the TFP function is assumed to be a function of two monetary policy instruments (short-term interest rate and money supply), inflation, exchange rate, trade openness and other exogenous factors. The choice of macro variables is consistent with small open economies even under the New Keynesian Framework (Clarida *et al.*, 2001, Ivrendi and Yildirim, 2013). Empirical literature indicates that monetary policy variables have an impact on factor productivity (Nourzard, 2002; Floden, 2000). Exchange rate has been extensively found to positively influence factor productivity (Harris, 2000; Courchene and Harris, 1999). In addition, owing to the openness of the economies under study, the exchange rate variable considered relevant for inclusion. Inflation (INF) variable is included in the model in order to capture the impact of macroeconomic instability on economic growth. High inflation is detrimental to economic growth. It creates uncertainty about future prices and interest rates, discouraging savings and investment. It also erodes the purchasing power of money (Fischer, 2005). Incorporating the factor productivity variables in the aggregate production function (APF) gives:

$$A_t = C IR_t^{\alpha} MS_t^{\mu} TOP_t^{\lambda} INF_t^{\delta} EXC_t^{\tau} \quad (6.2)$$

Where C is the time-invariant constant, IR is interest rate, MS is money supply, TOP is trade openness, INF is inflation and EXC is the exchange rate. Substitution of 6.2 into equation 6.1 gives

$$Y_t = C K_t^\alpha IR_t^\gamma MS_t^\mu TOP_t^\lambda INF_t^\delta EXC_t^\tau \quad (6.3)$$

Using the logarithmic transformation of the variables the specification of the empirical model can be written as:

$$LRGDP_t = \alpha L K_t + \gamma IR_t + \mu LMS_t + \lambda LTOP_t + \delta LINF_t + \tau LEXC_t + \varepsilon_t \quad (6.4)$$

Where K is capital stock. L represents for natural logarithm, ε other exogenous factors and t is a time transcript. The dependent variable Y_t represents economic growth, which is proxied by real gross domestic product (RGDP).

IR_t is the short-term interest rate, a proxy for monetary policy rate. The interest rate variable is not expressed in natural logarithm since it is already in a percentage. The appropriate proxy in the selected countries is the Treasury bill rates, given the limited monetary policy practice of price (interest rate) targeting in the respective countries. MS is money supply which is also used as a proxy for monetary policy. TOP is trade openness, EXC is the exchange rate and INF represents inflation.

The log linear model helps reduce the heteroscedasticity problem because it reduces the scale in which the variables are measured from the tenfold to a twofold (Gujarati, 1995). It also caters for the proliferative effect of time series data. According to the growth theory, the expected signs of the coefficients are; α, μ, λ and $\tau, > 0$ while γ and $\delta < 0$

Specification of the above model is done for each of the EAC countries under study (Uganda, Kenya and Tanzania).

6.3 Estimation Techniques

This section discusses the estimation techniques used to explore the impact of monetary policy and economic growth. In order to explore the impact, this study employs the ARDL procedure for cointegration testing. Prior to cointegration analysis, stationarity tests are conducted and once cointegration analysis is conducted, the error correction model is developed for short run analysis.

Modern time series analysis requires data to be stationary. Non stationary variables may have a time variant mean and/or non-constant variance, which means that working with such variables in their levels, will give a high likelihood of spurious regression results. Furthermore, no inference can be made from the results since the standard statistical tests like the “F” and “t” distributions are invalid.

Some transformations should, therefore, be applied to time series to render them stationary and the commonest practice is differencing. However, this makes data lose the long-run information. A non-stationary series is said to be integrated of order d when it becomes stationary after differencing. Unit root tests are performed on both the levels and the first differences of all relevant variables.

Valid estimates and inferences of time series data are, however, possible so long as a set of non-stationary variables are cointegrated, that is, there exists a set of linear combination of variables that are stationary (Engle and Granger, 1987). Accordingly, if sets of non-stationary variables cointegrate, then a corresponding error correction model (ECM), which encompasses models in both levels and differences of variables, can be specified and is consistent with long-run equilibrium behavior. The next sub-sections, Sections 6.3.1, 6.3.2 and 6.3.3, will respectively present the stationarity Tests; Autoregressive Distributed Lag (ARDL) Bounds testing approach to cointegration and the Error Correction Model.

6.3.1 Stationarity Tests

Pre-testing for unit roots is often a first step in the cointegration modelling. The process is stationary when the mean and the variance of the time series are constant over time, and the covariance is independent of time. The time series is identified as non-stationary when these qualifying conditions are not met (Gujarati, 2003). Co-integration tests require that the variables be integrated in the same order. Implementation of unit root tests is necessary to ensure that none of the variables is integrated of order 2 or beyond.

ARDL bounds testing approach requires that the variables are not integrated of order more than one. The presence of an $I(2)$ series makes the ARDL procedure void as the computed F-Statistic would be invalid. The Commonly-used unit root tests with the null of non-stationarity are the Dickey-Fuller (DF) test, the Augmented Dickey-Fuller (ADF) test, the Phillips-Perron (PP) test, Schmidt and Phillips (SP) test, the Ng-Perron (NP) test, and the Elliot, Rothenberg and Stock Point Optimal (ERS) and the Generalised Least Squared Dickey Fuller tests.

Tests with the null hypothesis of stationarity are the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test, Leybourne and McCabe (LC) test, and Arellano and Pantula test (1995). A bound testing is based on assumption that the variables are either $I(0)$ or $I(1)$ or a mixture of both. This study employed the Augmented Dickey-Fuller (ADF), DF-GLS test for the autoregressive unit root recommended by Elliot *et al.* (1996) and Phillips and Peron (1988) unit root tests. The combination of these tests is robust and the latter two perform well for small sample spaces, and address the problem of sensitivity of unit root testing to choice of lag. All unit root estimations will be computed using Eviews 9.5. The respective unit roots tests are presented in Section 6.3.1.1, Section 6.3.1.2 and Section 6.3.1.3.

6.3.1.1 Augmented Dickey-Fuller (ADF)

The ADF is a unit root test for time series is presented in equation 6.5 and assumes that the series follows an AR(k) process in a bid to correct for higher order correlation.

$$\Delta y_t = \partial + \phi y_{t-1} + \sum_{j=1}^k \alpha_j \Delta y_{t-j} + \varepsilon_t \quad (6.5)$$

Where ∂ is an intercept and ε_t is a white noise. The lagging of Δy_{t-j} provides for the correction of serial correlation of the error term. The null hypothesis of ADF is $\phi = 0$ against the alternative hypothesis of $\phi < 0$. Rejection of the null hypothesis implies that the time series is stationary.

6.3.1.2 Dickey-Fuller Generalised Least Square (DF-GLS)

This method has best overall performance over Augment Dickey Fuller (ADF) tests in terms of sample size and power. It improves the efficiency of the more traditional augmented Dickey-Fuller or Phillips-Perron tests, achieving substantially higher power at a cost of only slightly higher size distortions. It is also powerful unit root test, especially for small sample sizes and when an unknown mean or trend is present (Hayashi (2000)). The Generalized Least Square Dickey Fuller (DF-GLS) unit root test Elliott *et al.* (1996) modifies the ADF-test using a GLS rationale. A modification to the ADF regression is done by de-trending the data before the unit root test is conducted. This de-trending is done by taking the explanatory variables out of the data (see, Elliott *et al.*, 1996).

Elliott *et al.* (1996) optimise the power of the ADF test by de-trending which follows:

$$y_t^d = y_t - \beta' z_t \quad (6.6)$$

Where $z_t = (1, t)'$ is used for detrending and the resultant equation estimated to determine the unit root in the variable is;

$$\Delta y_t^d = \partial y_{t-1}^d + \sum_{i=1}^k \beta_i \Delta y_{t-i}^d + \varepsilon_t \quad (6.7)$$

Where Δ the difference operator is y_t^d is the generalised least squares de-trended value of the variable, k is the maximum lag, ∂ and β_i is coefficients to be estimated and ε_t is the independently and identically distributed error term. The test for a unit root of the variable y involves examination of the coefficient of the AR (1) term where the null hypothesis in equation 6.6 is $\partial=0$, against the alternative of $\partial \neq 0$.

The test is believed to be more efficient as it eliminates the nuisance parameters associated with the mean and intercept and also takes account of initial values that might impact the test (Beirne *et al.*, 2007).

6.3.1.3 Philips Perron (PP) Unit Root Test

Unlike the ADF unit root test, the PP (1988) approach sorts the serial correlation in errors by employing a nonparametric serial correlation correction factor premised on a consistent estimate of the long run variance of the error process. The PP unit root test is based on the ordinary least squares (OLS) parameter estimate and the test regression for the PP tests is shown in equation 6.8

$$\Delta y_t = \beta_0 A_t + y_{t-1} + \varepsilon_t \quad (6.8)$$

Where A_t is a vector of deterministic terms and ε_t is the error term. The null hypothesis of the PP test is also that a unit root exists, as against the alternative of stationarity. The PP test improves on the finite sample properties of the ADF test. In addition unlike ADF, the PP test does not require that the ε 's are conditionally homoscedastic. Another advantage is that one does not have to specify a lag length for the test regression.

6.3.2 Autoregressive Distributed Lag (ARDL) Bounds Testing Approach to Cointegration

The ARDL bounds testing is chosen for this study because of its profound advantages over the traditional cointegration methods such as the residual-based technique by Engle and Granger (1987), and the Full-Maximum Likelihood (FML) test, based on the work of Johansen (1988; 1991), and on the study of Johansen and Juselius (1990). Firstly, the bounds testing procedure does not require pre-testing of the series for unit roots to determine their order of integration, since it can be applied irrespective of the order of integration of the regressors, be it purely $I(0)$ or purely $I(1)$ or mutually integrated. The presence of $I(2)$ series renders the F- statistic invalid, making the ARDL procedure inapplicable. Secondly, the ARDL bounds technique addresses the endogeneity problems, if the modelling is done with appropriate lags. This procedure also corrects the serial correlation problem (Pesaran and Shin, 1999). This approach assumes that all variables are endogenous and long-run and short-run parameters are estimated simultaneously (Khan *et al.*, 2005). Thirdly, the method is asymptotically efficient in finite and small sample studies. This is essential for the sample of this study, which is relatively small. Fourthly, the Ordinary Least Squares (OLS) method can easily be applied for estimations once the model lag order is identified. The ARDL approach only employs a single reduced equation (Pesaran and Shin, 1999). The ARDL – bounds testing approach is, therefore, considered to be highly suitable for the analysis of the underlying relationships in this study.

Following Pesaran *et al.* (2001), the ARDL representation of the empirical model in equation (6.4) is shown as equation 6.9:

$$\begin{aligned} \Delta LY_t = & \delta_0 + \sum_{i=1}^n \delta_{1i} \Delta LY_{t-i} + \sum_{i=0}^n \delta_{2i} \Delta LK_{t-i} + \sum_{i=0}^n \delta_{3i} \Delta IR_{t-i} + \sum_{i=0}^n \delta_{4i} \Delta LMS_{t-i} + \\ & \sum_{i=0}^n \delta_{5i} \Delta LTOP_{t-i} + \sum_{i=0}^n \delta_{6i} \Delta LINF_{t-i} + \sum_{i=0}^n \delta_{7i} \Delta LEXC_{t-i} + \alpha_1 LY_{t-1} + \alpha_2 LK_{t-1} + \\ & \alpha_3 LIR_{t-1} + \alpha_4 LMS_{t-1} + \alpha_5 LTOP_{t-1} + \alpha_6 LINF_{t-1} + \alpha_7 LEXC_{t-1} + \vartheta_t \end{aligned} \quad (6.9)$$

where δ_0 is the drift component, n is the lag length, Δ is the difference operator and ϑ_t is the white noise error. The terms with the summation represent the Error Correction (ECM) and α_1 - α_7 are long term coefficients.

The general model in equation 6.9 is estimated for each of the three countries. The first step is to determine the order of lags of the first differenced variables in equations 6.8 within the Ordinary Least Squares (OLS) estimation framework. The second step is to establish the presence of cointegration by applying bounds F-test to equation 6.9, in order to establish the existence of a long-run relationship. The null hypothesis of no cointegration, expressed as:

$$H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = 0$$

is tested against the alternative hypothesis of the existence of cointegration relationship, expressed as:

$$H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq \alpha_7 \neq 0$$

The establishment of long-term relationship of the model, the bounds testing procedure is carried out by conducting the Joint F-test with an asymptotic nonstandard distribution.

The computed F-statistic value is evaluated with the critical values tabulated in Table CI (iii) of Pesaran *et al.* (2001). Two asymptotic critical values bounds provide a test for co-integration when the independent variables are $I(d)$ (where $0 \leq d \leq 1$). One set of critical values assumes that all variables included in the ARDL model are $I(0)$, while the other is calculated on the assumption that the variables are $I(1)$. If the computed test statistic exceeds the upper critical bounds value, then the null hypothesis will be rejected. If the F-statistic falls into the bounds then the co-integration test becomes inconclusive. If the F-statistic is lower than the lower bounds value, then the null hypothesis of no co-integration cannot be rejected.

After establishing the cointegration relationship, the ARDL model (short run and long run) is often selected using Akaike Information Criterion (AIC) or the Schwartz Bayesian Criterion (SBC). The SBC uses the smallest possible lag length and is therefore described as the parsimonious model. The AIC chooses the maximum relevant lag length.

6.3.3 Error Correction Model

Following the establishment of the cointegration relationship, the short-run dynamic parameters are obtained by estimating an error correction model (ECM) associated with the long-run estimates.

The ECM is specified in equation 6.10;

$$\Delta LY_t = \delta_0 + \sum_{i=1}^n \delta_{1i} \Delta LY_{t-i} + \sum_{i=0}^n \delta_{2i} \Delta LK_{t-i} + \sum_{i=0}^n \delta_{3i} \Delta IR_{t-i} + \sum_{i=0}^n \delta_{4i} \Delta LMS_{t-i} +$$

$$\sum_{i=0}^n \delta_{5i} \Delta LTOP_{t-i} + \sum_{i=0}^n \delta_{6i} \Delta LINF_{t-i} + \sum_{i=0}^n \delta_{7i} \Delta LEXC_{t-i} + \gamma_1 ECM_{t-1} +$$

$$\tau_t \tag{6.10}$$

ECM_{t-1} is the error-correction term lagged once, obtained from the long-run equilibrium relationship and its coefficient is γ_1 measures the speed of adjustment to restore equilibrium in the dynamic model following a disturbance. It therefore shows how slowly or quickly the variable returns to equilibrium in the event of any shock. δ_1 - δ_7 are the respective coefficients, τ_t is residual and k is the lag length.

The coefficient of the lagged error correction term (γ_1) is negative and statistically significant to further confirm existence of cointegration relationship.

To ascertain the goodness of fit of the ARDL model, diagnostic tests and stability tests are conducted. The diagnostic tests examine the serial correlation, functional form,

normality and heteroscedasticity associated with the model. The structural stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ). Individual country (Uganda, Kenya, and Tanzania) estimations are carried out using Microfit 5.01.

6.4 Data Source and Definition of Variables

The study utilises annual time series data series from 1983 to 2013 for Uganda, Kenya, and Tanzania. The data were obtained from various sources: the World Bank, IMF, and national statistics from the respective central banks and bureaus of statistics.

Data on real GDP, gross fixed capital formation, the sum of exports and imports were obtained from the World Bank Development Indicators (World Bank, 2015). The CPI data series were obtained from the National Bureau of Statistics and the IMF International Financial Statistics (IFS) while the money supply (M2) and the 91 Treasury bill rates are obtained from the respective central banks and the IFS. Nominal exchange rate and the US CPI were obtained from the IFS.

Economic growth is proxied by the real GDP. Capital stock is measured by gross capital formation (in nominal terms). Money supply is measured by the intermediate monetary policy target of broad money (M2) while short-term interest rate is proxied by the Treasury bill rates. Exchange rate is measured by the real effective exchange rate and inflation is proxied by consumer price Index (2010=100). Description of variables is summarised in the Table 6.1.

Table 6.1: Definition and Sources of Variables

Variable	Definition	Source
Economic growth (Y)	Real GDP (RGDP)	World Bank and National Bureau of statistics
Capital (K)	Real Gross fixed capital formation (GFCF)	World Bank and National Bureau of statistics
Money supply (MS)	Real broad money (RM2)	CBK, BoU and BoT
Short term interest rate (IR)	Real 91 day Treasury bill rate(RTBIL)	IFS, CBK, BoU and BoT
Exchange rate (EXC)	RER	IFS
Inflation (INF)	Consumer Price Index(CPI)	National Bureau of Statistics
Trade openness(TOP)	Sum of Exports and imports to GDP(TOP)	World Bank

Note: CBK, BoU, and BoT represent Central bank of Kenya, Bank of Uganda, and Bank of Tanzania respectively.

6.5 Conclusion

This chapter has outlined the methodology used in the study to investigate the impact of monetary policy in three traditional East African Countries. The chapter has also discussed the estimation techniques employed in the analysis. The definition and measurement of variables used in the study have been provided. Data sources have also been indicated.

CHAPTER SEVEN

7. EMPIRICAL FINDINGS

7.1 Introduction

This chapter builds on the previous chapter that specified the empirical model and methodology used in this study. It presents the empirical analysis and results of the impact of monetary policy on economic growth in Uganda, Kenya and Tanzania. Independent variables of particular interest are the 91-day Treasury bill rate and money supply.

The chapter is organised into three sections: Sections 7.2, 7.3 and 7.4 present the empirical results and analysis based on the specified models, methodology and time series data respectively from Uganda, Kenya and Tanzania. In each country section, stationarity tests carried out using Eviews 9.5; the ARDL bounds test, empirical results and analysis (long-run and short-run) based on the specified ARDL models, and diagnostic tests from Microfit 5.01 are presented.

7.2 Empirical Findings for Uganda

7.2.1 Stationarity Tests for Uganda

The graphical representation from the data generation process of the time series data for Uganda is presented in Figure 7.1.

Figure 7.1: Graphical Expositions of the Time Series Variable Data for Uganda

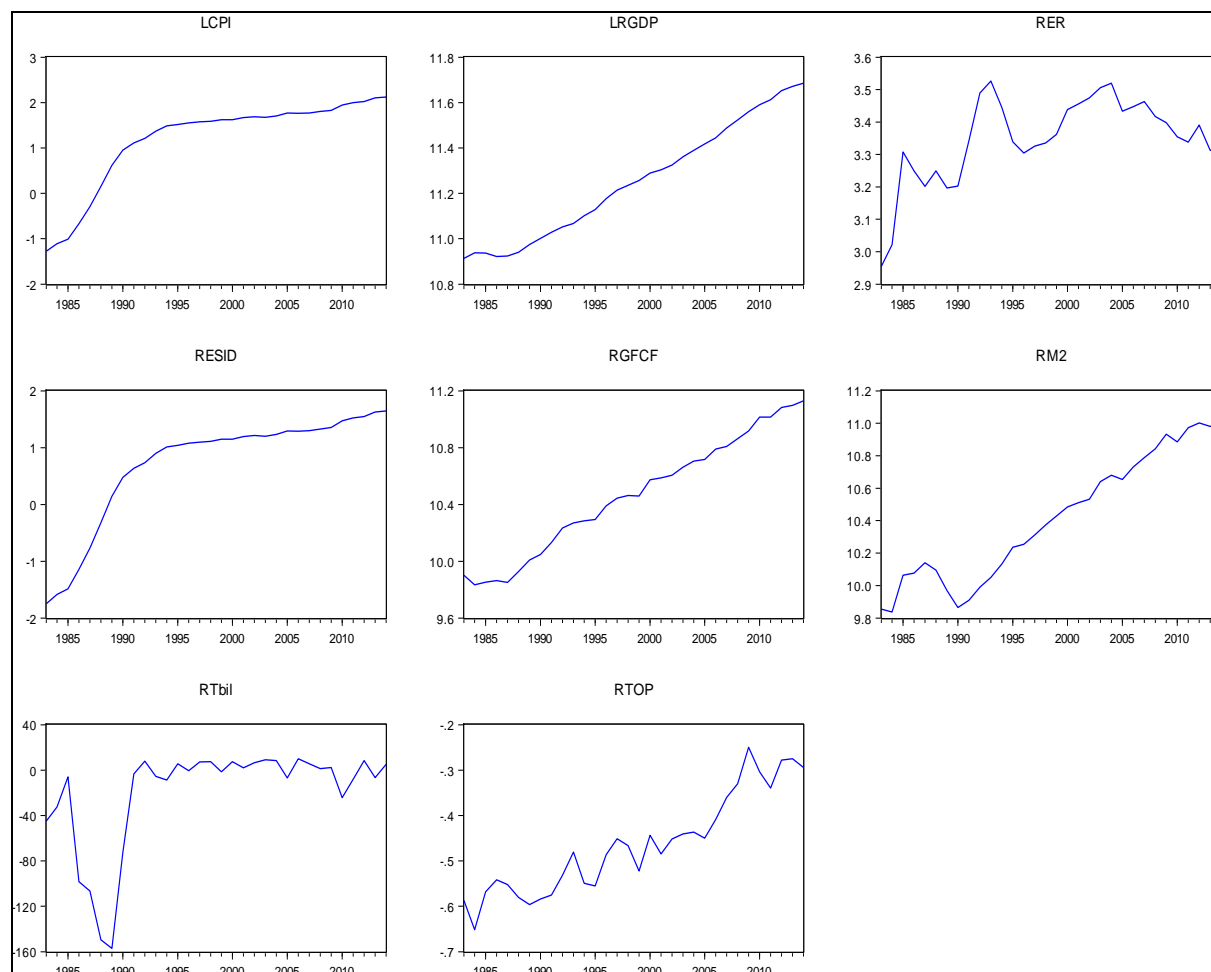


Figure 7.1 illustrates that all variables in Uganda are trend stationary except for the Treasury bill rate. However, all unit root tests for all variables report intercept as well both intercept and trend for all variables.

The results of all the unit root tests for all the variables are reported in Table 7.1, Table 7.2 and Table 7.3.

Table 7.1: Augmented Dickey Fuller for Uganda

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
LRGDP	1.951	-3.353*	-3.012**	-	I(0)
RTBIL	-1.809	-2.181	-4.556***	-4.471***	I(1)
LRM2	-0.340	-1.957	-4.836***	-4.741***	I(1)
LRER	-3.723***	-3.382*	-	-	I(0)
LCPI	-1.103	-2.215	-4.133***	-4.886***	I(1)
LGFCF	0.467	-4.308***	-6.539***	-	I(0)
LTOP	-0.851	-3.791**	-5.919***	-	I(0)

Notes: *, **, ***, denotes the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Table 7.2: Dickey- Fuller Generalised Least Squares (DF-GLS) for Uganda

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
LRGDP	-0.696	-1.911	-3.065***	-3.370**	I(1)
RTBIL	-2.152**	-2.918*	-	-	I(0)
LRM2	-1.608	-1.976	-4.559***	-4.818***	I(1)
LRER	-1.388	-2.569	-4.365***	-4.931***	I(1)
LCPI	-1.258	-2.349	-1.933*	-3.091*	I(1)
LGFCF	-1.124	-3.135*	-1.976*	-5.215***	I(0)
LTOP	-1.608	-2.313	-4.892***	-4.193***	I(1)

Notes: *, **, ***, denotes the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Table 7.3: Phillips-Perron (PP) Unit Root Test for Uganda

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
LRGDP	1.615	-4.240**	-3.041**	-	I(0)
RTBIL	-1.973	-2.383	-4.552***	-4.434***	I(1)
LRM2	-0.340	-1.957	-4.836***	-4.741***	I(1)
LRER	-3.437**	-2.791	-	-5.488***	I(0)
LCPI	-4.141	-4.141***	-	-	I(0)
LGFCF	0.507	-4.309***	-7.574***	-	I(0)
LTOP	-0.390	-3.743**	-6.778***	-	I(0)

Notes: *, **, ***, denotes the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Overall the above unit root results indicate that none of the variables are integrated of order two or higher. The results are a mix of integration of I(0) and I(1). Having variables that are integrated of order zero or one implies that ARDL bounds testing procedures can be used. The first step in this analysis is to determine the optimal lag length, using the Akaike Information Criterion (AIC) or the Bayesian Information Criterion (BIC).

This is followed by the application of the bounds F-test to establish a long-run relationship between the variables under study. The results of the bounds F-test are reported in Table 7.4

7.2.2 ARDL Bounds Test for Cointegration for Uganda

The ARDL bounds test results for Uganda are presented in Table 7.4

Table 7.4 : ARDL Bounds Test Results for Uganda

Dependent Variable	Function	F-test Statistics
LRGDP	F(LRGDP LRM2,RTBIL,LCPI,LRER,LGFCF,LTOP)	4.700***

Asymptotic Critical Values

Pesaran <i>et al.</i> (2001), p.300. Table CI(III) Case III	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2.12	3.23	2.45	3.61	3.15	4.43

Note: *** denotes significance at the 1% level

Given that the calculated F-statistic of 4.700 presented in Table 7.4 is greater than the upper bound value of 4.43 at the 1% significance level, the null hypothesis of no cointegration is rejected at the 1% significance level. This therefore implies the existence of a long-run relationship between the variables.

Following the establishment of the long-run relationship between the variables, the estimation of the long-run and short-run elasticities is carried out and presented in Table 7.5 (Panel A). The Schwarz Bayesian Criterion (SBC) was employed in selecting the lag length with the model specification of ARDL (1, 0, 2, 0, 0, 0, 0) because it produced more parsimonious results than the Akaike Information Criterion (AIC) based models.

Table 7.5 presents the long-run and short-run results of the selected ARDL model. The error correction representation is also presented in Table 7.5 (Panel B).

Table 7.5 : Results of ARDL for Uganda

Panel A: Long-run Coefficients - Dependent Variable is LRGDP				
Regressor	Coefficient	Standard Error	T-Ratio	Probability
C	4.914***	0.4929	9.968	0.000
LRM2	0.216***	0.055	3.910	0.001
RTBIL	-0.170	0.119	-1.432	0.168
LCPI	0.011**	0.0193	0.549	0.589
LRER	-0.098	0.045	-2.156	0.043
LGFCF	0.427***	0.085	4.993	0.000
LTOP	0.079	0.101	0.789	0.440
Panel B: Short-run Coefficients - Dependent Variable is ΔLRGDP				
ΔLRM2	0.107***	0.0298	3.600	0.002
Δ RTBIL	0.122*	0.616	1.985	0.060
Δ RTBIL1	0.120*	0.666	1.799	0.086
Δ LCPI	0.005	0.009	0.593	0.559
Δ LRER	-0.048 *	0.026	-1.842	0.080
ΔLGFCF	0.212*	0.075	2.816	0.010
LTOP	0.039	0.048	0.830	0.416
ECM (-1)	-0.497 ***	0.108	-4.617	0.000
R-Squared		0.804	R-Bar-Squared	0.716
SE of Regression		0.007	F-Stat F(8,21)	26.155 (0.000)
Residual Sum of Squares		0.001	DW statistic	2.126
Akaike Info. Criterion		101.539	Schwarz Bayesian Criterion	94.533

Note: *, ** and *** denotes stationarity at 10%, 5% and 1% significance levels.

The long-run results reported in Panel A of Table 7.5 reveal that in Uganda, money supply as a monetary policy instrument has a positive impact on economic growth. This is evidenced by the coefficient of money supply, which is statistically significant and

positive. The results show that a 1% increase in money supply will result in a 0.22% increase in economic growth. Thus, an increase in the money supply leads to an increase in economic growth in Uganda in the long run. The long-run non-neutrality of money supply could be due to distortionary impact of money supply on prices and allocation of resources, as well as by nominal rigidities in the adjustment of prices.

The results further reveal that short-term interest rate, as an instrument of monetary policy in Uganda has no significant impact on economic growth, as shown by the statistically insignificant coefficient of Treasury bill rate. These results are not unusual; they are consistent with the works of Buigut (2009) and Nogueira (2009). This could be due to the fact that Uganda operated a monetary targeting regime for most of the period under study and thus short-term rate was less likely to be informative to long-term interest rates. This is also explained by weak interest rate transmission channel found in Uganda (Mugume, 2011; Buigut, 2009). The interest rate weak transmission mechanism could be attributed to shallowness of financial markets, the independence of central bank and the oligopolistic structure of the banking system. The results could also be attributed to the weak structural, institutional and regulatory framework.

The other long-run results also show that the coefficients of gross fixed capital formation and real exchange rate are statistically significant and in tandem with growth theory. The coefficient of gross fixed capital formation is positive, while the coefficient of real exchange rate is negative. The coefficients of consumer price index and trade openness are found to be insignificant.

The short-run results reported in Panel B of Table 7.5 indicate that the coefficient of the error correction term lagged once is -0.497 and statistically significant at the 1% level. The negative coefficient of the ECM indicates a convergence of the real GDP model to its long-run equilibrium. This also confirms the long-run equilibrium relationship between real GDP and the regressors. The results suggest that the disequilibrium arising out of shock to the economic growth model will be totally corrected in two years at a rate of 49.7% per annum.

The short-run results also reported in Panel B of Table 7.5 indicate that the coefficient of money supply is positive and significant, implying the existence of a positive short-run relationship between money supply and economic growth. This also implies that the instability of the money multiplier did not affect the monetary transmission in Uganda consistent with findings by Davoodi *et al.* (2013).

The coefficient of Treasury bill rate is positive and statistically significant at the 10% level. This finding contrasts with theoretical expectations of this study and of some past empirical studies on Uganda by Davoodi *et al.* (2013) and Mugume (2011). However, previous studies by Dele (2007), Rafiq and Mallick (2008), Chaudhry *et al.* (2012) and Ivrendi and Yildirim (2013) revealed similar findings of a positive relationship between short term interest rate and economic growth. This could be attributed to higher interest rates, encouraging the savings, which translate into productive investments and growth rates of GDP. In addition, the interest rate structure may in part reflect the effects of fiscal policy intervention, moderating the effect of monetary policy response.

The other short run results reveal that the coefficients of all other variables, except consumer price index and trade openness, are statistically significant. The results further show that the coefficient of gross fixed capital formation is positive (statistically significant at 1%) while the coefficient of real exchange rate is negative (significant at 10%).

The regression for the underlying ARDL model fits very well with an R^2 of 80.4%. Table 7.6 presents the ARDL model diagnostic tests for Uganda.

Table 7.6: ARDL-VECM model diagnostic tests for Uganda

LM Test Statistics	Results [Probability]
Serial Correlation CHSQ(1)	0.331[0.565]
Functional Form CHSQ(1)	1.608[0.205]
Normality CHSQ(2)	2.130[0.345]
Heteroscedasticity CHSQ(1)	0.138[0.710]

The diagnostic test results presented in Table 7.5 confirm the statistical robustness of the estimated model. The model also passes the diagnostic tests against serial correlation, functional form misspecification, non-normal errors (normality) and heteroscedasticity test. The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) plots of the model for Uganda are reported respectively in Figure 7.2 and Figure 7.3.

Figure 7.2: Plot of CUSUM for Uganda

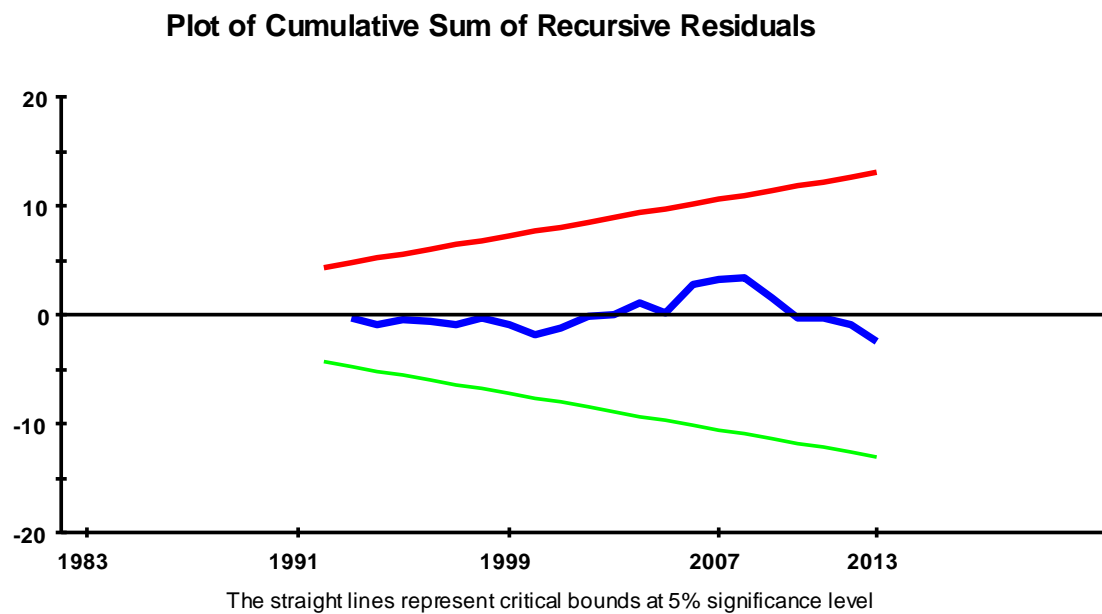
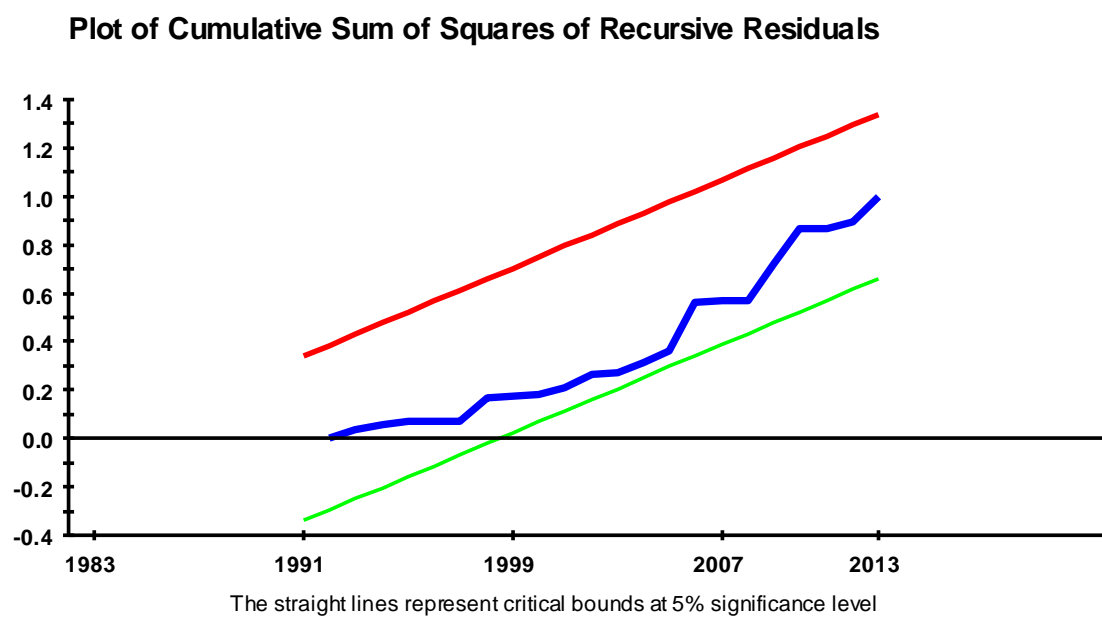


Figure 7.3: Cumulative sum of squares (CUSUMQ) plots for Uganda



The CUSUM and CUSUMQ results in Figure 7.2 and Figure 7.3 respectively reveal stability in the coefficients over the sample period, since their plots fall consistently within their 95% confidence level.

7.2.3 Summary of the findings for Uganda

The chapter focused on examining the impact of monetary policy on economic growth during the period from 1971 to 2013 using the recently developed ARDL bounds testing approach by Pesarran and Shin (1999), due to its unique advantages over small samples. Two monetary policy variables, namely money supply (M2) and short term interest rate (91-day Treasury bill rate) were utilised. This study finds that money supply has both a short-run and a long-run impact on economic growth. The findings reveal that the short-term interest rate proxied by the Treasury bill rate has a positive impact on economic growth in the short run, but not in the long run. The short-run relationship between short-term interest rate and economic growth, also known as the output puzzle, is contrary to theoretical expectations. These results suggest the pronounced role of money supply relative to short term interest rate – which could be attributed to the financial structure and independence of the central bank over the sample period.

7.3 Empirical Findings for Kenya

7.3.1 Stationarity Results for Kenya

The graphical representation of the time series used in this study for Kenya is presented in Figure 7.4

Figure 7.4: Graphical Expositions of the Time Series Variable Data for Kenya

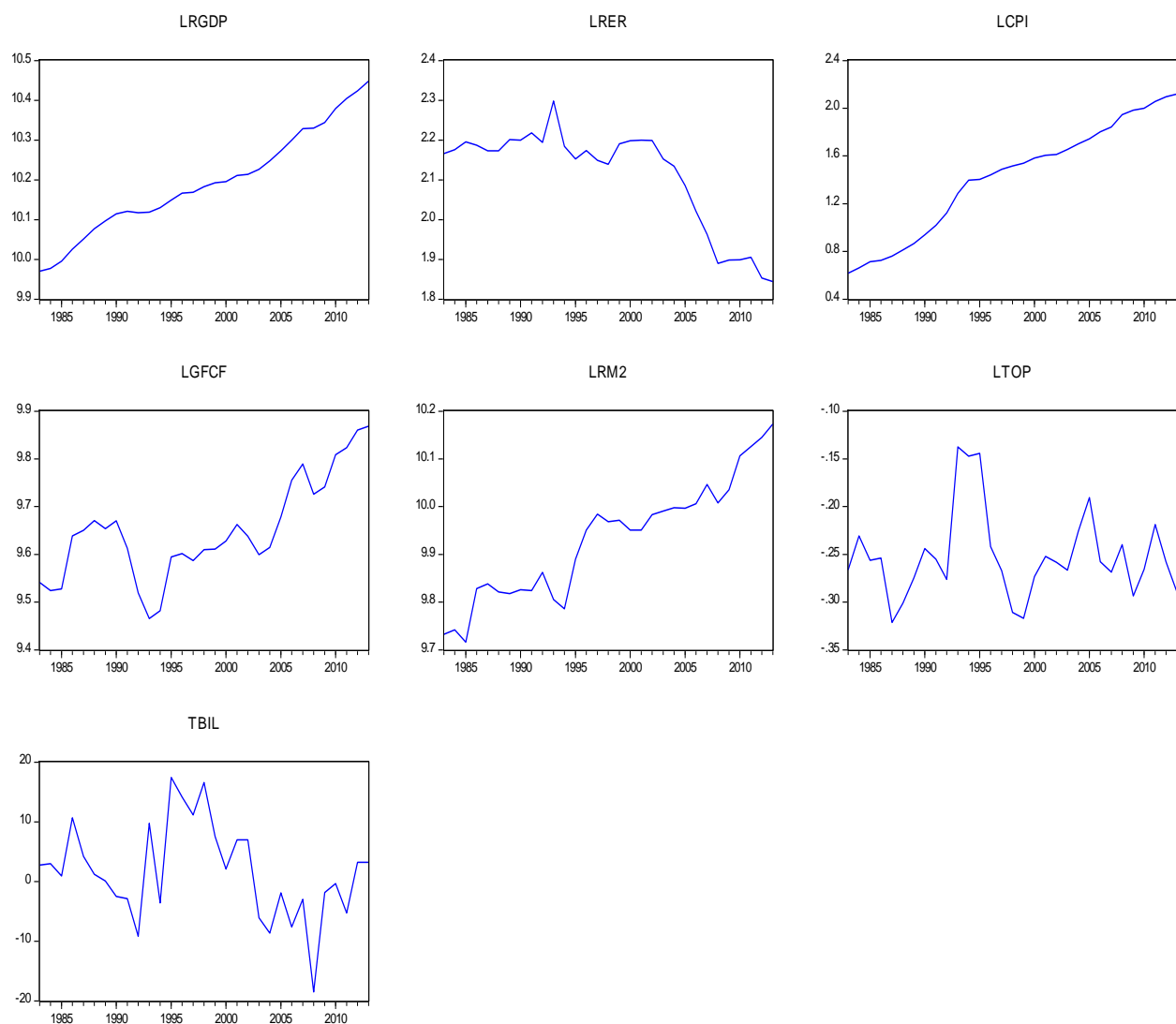


Figure 7.4 shows that when conducting unit roots, all variables except real Treasury bill rate are trend stationary. The unit root test results for all variables (intercept as well intercept and trend) in levels and first difference are presented in Table 7.7, Table 7.8 and Table 7.9.

Table 7.7: Augmented Dickey Fuller for Kenya

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With trend	No trend	With trend	
LRGDP	0.282	-1.657	-5.731***	-5.463***	I(1)
RTBIL	-2.208	-2.139	-7.579***	-7.869***	I(1)
LM2	-0.626	-3.061	-6.307***	-6.245***	I(1)
LRER	-0.023	-0.566	-5.940***	-6.108***	I(1)
LCPI	-1.196	-2.038	-3.956***	-4.041**	I(1)
LGFCF	-1.256	-2.837	-4.969***	-5.519***	I(1)
LTOP	-3.514**	-3.810**	-	-	I(0)

Notes: *, **, ***, denotes the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Table 7.8: Dickey- Fuller Generalised Least Squares (DF-GLS) for Kenya

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With trend	No trend	With trend	
LRGDP	2.166**	-1.658	-	-3.220**	I(0)
RTBIL	-2.409**	-2.182	-	-6.939***	I(0)
LM2	0.476	-3.097*	-6.062***	-	I(0)
LRER	-0.056	-0.849	-6.013***	6.271***	I(1)
LCPI	-0.069	-2.231	-3.525***	-3.908***	I(1)
LGFCF	-0.286	3.001*	-4.848***	-	I(0)
LTOP	-3.304***	-3.891***	-	-	I(0)

Note: *, ** and *** denote the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Table 7.9: Phillips-Perron (PP) Unit Root Test for Kenya

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
LRGDP	-1.505	-3.162	-5.730***	-5.463***	I(1)
RTBIL	-3.666***	-3.835**	-	-	I(0)
LRM2	-0.135	-2.939	-6.787***	-9.269***	I(1)
LRER	-0.329	-0.693	-5.998***	-6.191***	I(1)
LCPI	-0.853	-1.626	-3.932***	-4.081**	I(1)
LGFCF	-0.296	-1.882	-5.203***	-7.598***	I(1)
LTOP	-3.541**	-3874**	-	-	I(0)

Note: *, ** and *** denote the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

The unit root test results reported in Table 7.7, Table 7.8 and Table 7.9 reveal that all variables are integrated of I(0) or I(1), supporting the application of the ARDL bounds testing approach to co-integration.

7.3.2 ARDL Bounds Test Results for Cointegration for Kenya

The results of the ARDL bounds testing approach to co-integration for Kenya are reported in Table 7.10

Table 7.10: ARDL Bounds Test Results for Kenya

Dependent Variable	Function	F-test Statistics
LRGDP	F(LRGDP LRM2, RTBIL, LGFCF, LTOP, LRER, LCPI)	5.863***
Asymptotic Critical Values		

Pesaran <i>et al.</i> (2001), p.300. Table CI(III) Case III	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2.12	3.23	2.45	3.61	3.15	4.43

Note: *** denotes significance at the 1% level

Since the computed F-value of 5.863 as shown in Table 7.10 exceeds the upper bound critical value of 4.430 at the 1 per cent level of significance, we cannot reject the existence of a stable long-run (level) relationship among the variables (LRGDP, LRM2, RTBIL, LGFCF, LTOP, LRER and LCPI), confirming that the variables are co-integrated.

The optimal lag for both the long-run and short-run ARDL models is selected based on Schwartz Bayesian criteria because the respective models were more parsimonious than Akaike information criteria. The model estimated is ARDL (1, 0, 0, 1, 0, 0, 2). The long-run results are reported in Panel A of Table 7.11, while the short-run dynamics are reported in Panel B of Table 7.11.

Table 7.11: Results of ARDL Model for Kenya

Panel A: Long-run Coefficients – (Dependent Variable – RGDP)				
Regressor	Coefficient	Standard Error	T-Ratio	Probability
C	6.229***	1.083	5.754	0.000
LRM2	0.083	0.105	0.793	0.434
RTBIL	0.113	0.651	0.173	0.864
LGFCF	0.349***	0.067	5.143	0.000
LTOP	-0.264***	0.081	-3.275	0.003
LRER	-0.071	0.053	-1.356	0.185
LCPI	0.059***	0.018	3.237	0.003
Panel B: Short-run Coefficients (Dependent Variable – ΔRGDP)				
ΔLRM2	0.068	0.086	0.790	0.436
ΔRTBIL	0.923	0.528	0.175	0.862
ΔLGFCF	0.285***	0.064	4.488	0.000
ΔLTOP	-0.215***	0.077	-2.786	0.009
ΔLRER	0.083	0.090	0.927	0.361
ΔLCPI	-0.089	0.13	-6.85	0.498
ΔLCPI(1)	-0.422***	0.118	-3.584	0.001
ecm(-1)	-0.817***	0.099	-8.273	0.000
R-Squared	0.843		R-Bar-Squared	0.791
SE of Regression	0.015		F-Stat F(8,32)	20.118
Residual Sum of Squares	0.007		DW statistic	2.263
Akaike Info. Criterion	109.164		Schwarz Bayesian Criterion	99.739

Note: *** denotes significance at the 1% level

The results from long-run analysis presented in Table 7.11 (Panel A) reveal that the coefficients of monetary policy measured by the broad money supply and three-month Treasury bill rate are statistically insignificant. The results suggest long-run money supply and short-term interest monetary policy neutrality. This is corroborated by similar findings on Kenya by Kamaan (2014). Buigut (2009) also found that interest rate based monetary policy had no statistically significant effect on real output in Kenya. Long-run money supply monetary policy neutrality is found in other previous studies (see, among others, Bernanke and Mihov, 1998; Bullard, 1999; Nogueira, 2009; Asongu, 2014).

The insignificant impact of monetary policy on economic growth could be explained by the fiscal prominence and nature of the financial structure, characterised by a low level of development, banking sector dominance of the financial sector and the oligopolistic nature of the banking industry (Mishra *et al.*, 2012).

Fiscal policy characterised by large and rising fiscal deficits in some instances has been found not to be coordinated with monetary policy, with a risk of compromising the monetary autonomy (Morekwa *et al.*, 2007; IMF, 2016). The results could also be attributed to the weak structural, institutional and regulatory framework. The volatility of the money multiplier, in part explained by rapid financial innovations, suggests the likelihood of prediction errors of output, velocity of money, and inflation, at the risk of undermining the reserve money targeting (Adam *et al.*, 2010b; Nyamongo and Ndirangu 2013).

The other long-run results show that the coefficients of real gross fixed capital formation and consumer price index are positive and statistically significant, suggesting a positive impact on economic growth. However, the coefficient of trade openness is negative and statistically significant. The coefficient of real exchange rate is found to be statistically insignificant.

The results from the short-run analysis presented in Table 7.11 (Panel B) reveal short-run monetary neutrality where the coefficients of monetary policy measured by the broad money supply three month Treasury bill rate are both statistically insignificant.

Short-run money supply neutrality is traceable in studies by Fasanya and Onakoya (2013) and Chaudhry *et al.* (2012).

The other short-run results reveal that the coefficient of real gross fixed capital formation is positive and statistically significant. The result for trade openness is consistent with the long-run results, while the coefficient of real exchange rate is statistically insignificant. In the short run, the consumer price index is found to have no impact but the coefficient of its lag is found to have a negative and statistically significant impact on economic growth in Kenya.

The coefficient of the error correction term of -0.82 is highly significant, corroborating both the quick convergence of the real GDP equation to its long run equilibrium (corrected in the next period/year) and the presence of co-integration (Banerjee *et al.*, 1998). The regression for the underlying ARDL model fits well, with an R-squared of 84.3%. Table 7.12 presents the diagnostic tests.

Table 7.12: ARDL-VECM Model Diagnostic Tests for Kenya

LM Test Statistics	Results
Serial Correlation*CHSQ(1)	1.908(0.167)
Functional Form *CHSQ(1)	0.955 (0.329)
Normality *CHSQ(2)	1.014 (0.602)
Heteroscedasticity*CHSQ(1)	1.880(0.170)

The model passes all diagnostic tests against heteroscedasticity, normality, serial correlation and functional form, as reported in Table 7.12. The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) plots of the model for Kenya are reported respectively in Figure 7.5 and Figure 7.6

Figure 7.5: CUSUM for Kenya

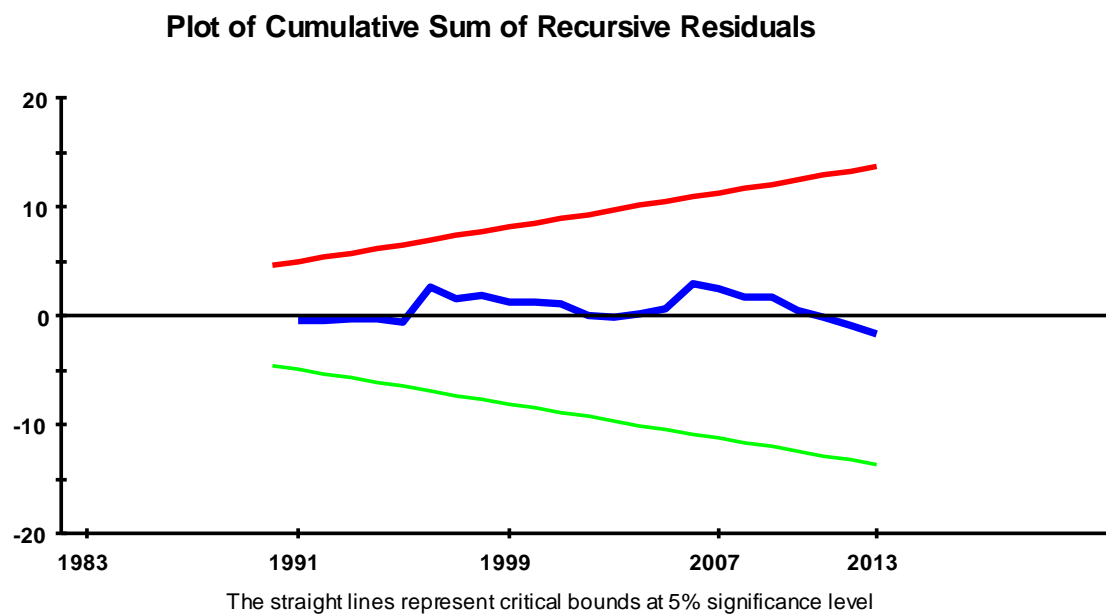
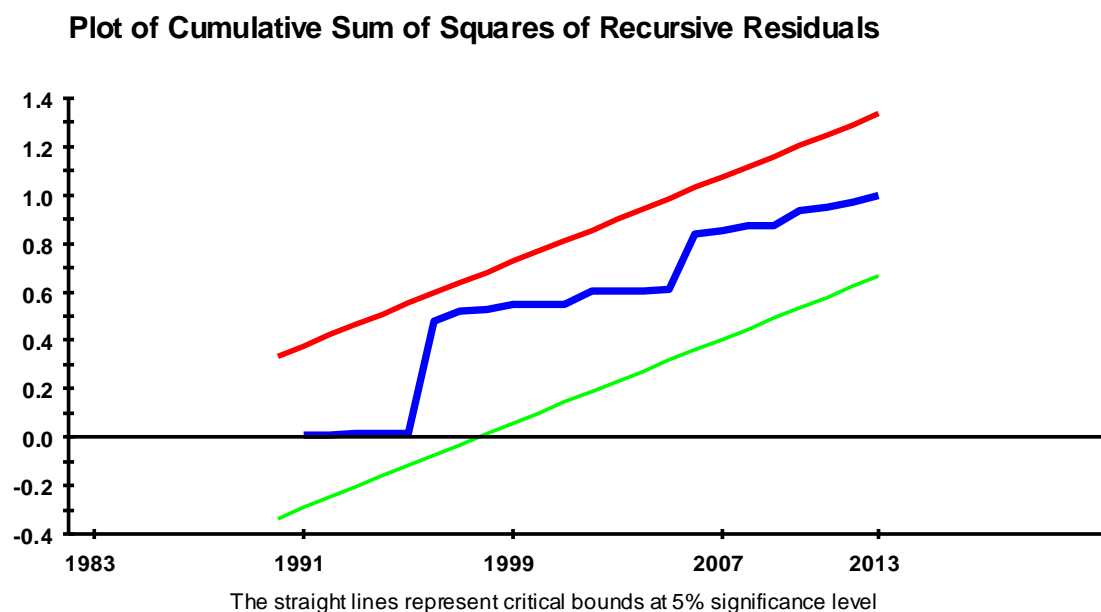


Figure 7.6: CUSUMQ for Kenya



The CUSUM and CUSUMQ presented in Figure 7.5 and Figure 7.6 lie within the critical bounds at a 5 per cent confidence interval, confirming the stability of the model. Both the diagnostic tests and the CUSUM tests confirm the statistical robustness of the estimated model.

7.3.3 Summary of Findings for Kenya

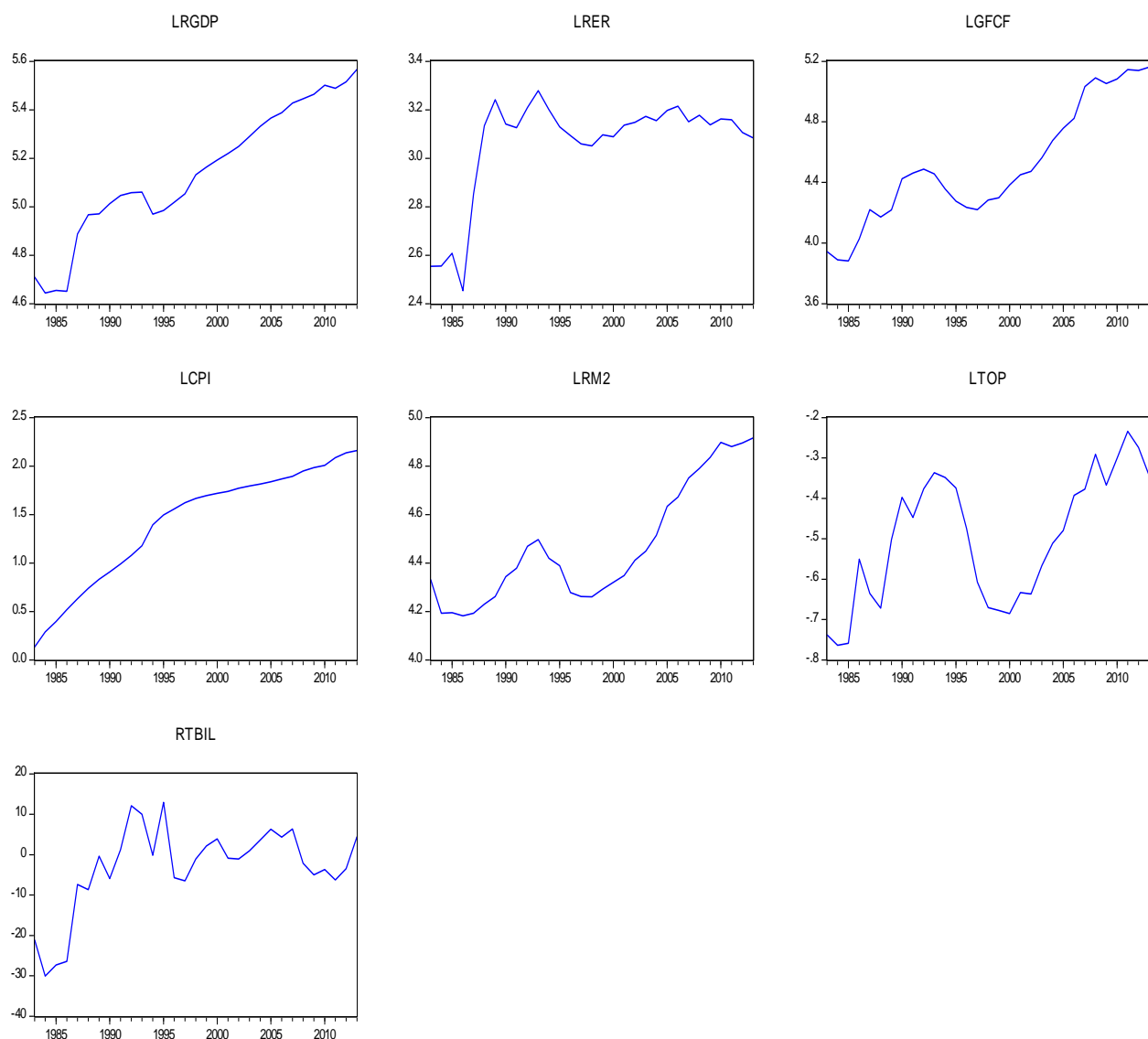
The section 7.3 discussed the Auto Regressive Distributive Lag (ARDL) bounds testing approach results for monetary policy and economic growth nexus in Kenya during the period from 1983 to 2013. Broad money supply (M2) and the three month Treasury bill rate were used as monetary policy variables. Both short-run and long-run empirical results suggest monetary policy neutrality in Kenya, implying that monetary policy has no effect on economic growth, both in the short run and in the long run. The outcome may be explained by the fact that the bulk of the fiscal deficits are funded domestically. This may have weakened the transmission of monetary policy into the economy.

7.4 Empirical Findings for Tanzania

7.4.1 Stationarity Results for Tanzania

The graphical representation of the data series for Tanzania is presented in Figure 7.7.

Figure 7.7: Graphical Expositions of the Time Series Variable Data for Tanzania



Graphical illustration in Figure 7.7 suggests that the variables, real GDP, real gross fixed capital formation, and consumer price index are trend stationary, while trade openness, real Treasury bill rate, and real exchange rate are difference stationary. The unit root tests include constant and trend as well as only constant for all the variables. The Augmented Dickey-Fuller (ADF), Dickey-Fuller Generalised Least Square (DF-GLS) and the Phillips-Perron unit root tests presented in Table 7.13, Table 7.14 and Table 7.15.

Table 7.13: Augmented Dickey Fuller for Tanzania

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
					I(d)
LRGDP	0.264	-2.913	-4.484***	-4.642***	I(1)
LRM2	-0.940	-2.473	-3.963***	-4.084**	I(1)
RTBIL	-2.648*	-3.033*	-	-	I(0)
LGFCF	-0.095	-2.226	-4.289***	-6.339***	I(1)
LRER	-1.467	-1.814	-5.074***	-5.015***	I(1)
LTOP	-1.601	-2.030	-4.805***	-4.769***	I(1)
LCPI	-2.501	-0.661	-2.986**	-3.651**	I(1)

Notes: *, **, ***, denotes the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Table 7.14: Dickey-Fuller Generalised Least Square (DF-GLS) for Tanzania

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
LRGDP	-0.581	-1.653	-3.566***	-4.343***	I(1)
LRM2	-0.200	-1.709	-3.311***	-3.995***	I(1)
RTBIL	-2.140**	-3.030*	-	-	I(0)
LGFCF	0.301	-1.247	-3.929***	-4.148***	I(1)
LRER	-1.303	-1.900	-5.132***	-5.171***	I(1)
LTOP	-1.497	-1.533	-4.337***	-4.803***	I(1)
LCPI	-0.846	-1.065	-2.487**	-3.194**	I(1)

Note: *, ** and *** denote the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

Table 7.15: Phillips-Perron Test for Tanzania

Variables	Stationarity of Variables in Levels		Stationarity of Variables in First Differences		Status
	No trend	With Trend	No trend	With Trend	
LRGDP	0.312	-1.955	-4.497***	-4.642***	I(1)
LRM2	-0.242	-1.311	-3.717***	-4.218**	I(1)
RTBIL	-2.674*	-3.135*	-	-	I(0)
LGFCF	-2.090	-1.626	-4.669***	-4.423***	I(1)
LRER	-1.573	-2.015	-5.083***	-5.037***	I(1)
LTOP	-1.964	-1.861	-4.783***	-4.698***	I(1)
LCPI	-0.174	-0.223	2.963**	-3.571**	I(1)

Note: *, ** and *** denote the rejection of the null hypothesis of unit root at the 10%, 5% and 1% significance levels respectively.

The respective unit root tests used reported in Table 7.14 and Table 7.15 confirm the absence of I (2) and beyond. Both tests confirm that only the Treasury bill rate is an I (0), while the rest are I (1).

7.4.2 ARDL Bounds Test Results for Cointegration for Tanzania

The results of the ARDL bounds testing approach to co-integration for Tanzania are reported in Table 7.16.

Table 7.16: ARDL Bounds Test Results for Tanzania

Dependent Variable	Function				F-test Statistics	
LRGDP	F(RGDP RM2,RTBIL,RGFCF,RER,TOP,ICPI)				4.63***	
Asymptotic Critical Values						
Pesaran et al. (2001), p.300. Table CI(III) Case III	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2.12	3.23	2.45	3.61	3.15	4.43

Note: *** denotes significance at the 1% level

Table 7.16 presents the bounds test results – confirming the existence of a long-run relationship among real GDP, money supply, Treasury bill rate, gross fixed capital formation, real exchange rate, trade openness, and inflation.

The computed F – statistic is 4.63, as shown in Table 7.16 and is statistically significant at the 1% significance level, implying that these variables have a long-run relationship among themselves. Following the confirmation of the existence of a long-run relationship between the variables in the model, the long-run and short-run models were derived using SBC due to the more superior results relative to AIC. The selected ARDL model, based on the SBC criteria, is an ARDL model (1, 0, 1, 0, 2, 1, 2). The long-run results are reported in Panel A of Table 7.17, while the short-run dynamics are reported in Panel B of Table 7.17.

Table 7.17: Results of ARDL Model for Tanzania

Panel A: Long-run Coefficients - Dependent Variable is RGDP

Regressor	Coefficient	Standard Error	T-Ratio	Probability
C	6.453***	2.219	2.908	0.008
RM2	-0.679	0.447	-1.518	0.143
TBIL	-0.002	0.003	-0.745	0.464
GFCF	0.640***	0.224	2.845	0.009
RER	-0.308	0.312	-0.987	0.334
TOP	0.512	0.355	1.442	0.163
CPI	0.202***	0.072	2.806	0.010

Panel B: Short-run Coefficients - Dependent Variable is Δ RGDP

ΔRM2	-0.205***	0.069	-2.940	0.007
ΔTBIL	0.001	0.781	1.507	0.143
ΔGFCF	0.193***	0.055	3.527	0.002
ΔRER	0.163***	0.488	3.339	0.002
ΔRER1	0.083*	0.041	2.036	0.052
ΔTOP	-0.060	0.066	-0.900	0.376
ΔCPI	-0.216	0.266	-0.811	0.424
ΔCPI1	-0.513**	0.241	-2.130	0.042
ECM (-1)	-0.301**	0.117	-2.572	0.016
R-Squared	0.911		R-Bar-Squared	0.861
SE of Regression	0.017		F-Stat F(9,27)	26.155 (0.000)
Residual Sum of Squares	0.007		DW statistic	2.172
Akaike Info. Criterion	92.542		Schwarz Bayesian Criterion	81.266

Note: *** denotes significance at the 1% level

The long-run results reported in Panel A of Table 7.17 indicate that the coefficients of both monetary policy variables, i.e., interest rate and money supply, are statistically insignificant, suggesting long-run monetary policy neutrality. The long-run monetary policy neutrality is backed by a wide range of empirical findings (see, among others, Bullard, 1999; Nogueira, 2009). The coefficient of gross fixed capital formation is positive in the long run, consistent with Fosu and Magnus (2006). Also, the long-run effect of inflation is found to be positive, which is contrary to the *a priori* expectation of a negative sign. The long-run positive effect of inflation on economic growth is supported by empirical evidence from Malik and Chowdhury (2001).

As seen in Panel B of Table 7.17, the short-run effect of the interest rate is insignificant, while the coefficient of money supply is found to be negative and statistically significant, contrary to *a priori* expectation. While the short-run money supply's negative effect on economic growth was unexpected, the results are consistent with other studies (Amarasekara, 2009).

Also, in the short run, the coefficient of capital, real exchange rate and its lag are found to be positive and statistically significant. Unlike the long-run results, the coefficient of inflation is statistically insignificant, but its lag is found to have a negative and significant impact on economic growth. The coefficient of ECM (-1) is -0.301 and is statistically significant at the 5% level. This implies that the disequilibrium occurring due to a shock is totally corrected in about 3 years and 4 months at a rate of about 30.1% per annum.

Table 7.18 displays the diagnostic tests results of serial correlation, normality, functional form, and heteroscedasticity.

Table 7.18: ARDL-VECM Model Diagnostic Tests for Tanzania

Test Statistics	Results
Serial Correlation	0.514(0.473)
Functional Form	2.308(0.129)
Normality	2.362(0.307)
Heteroscedasticity	0.486(0.486)

The results displayed in Table 7.18 show that the model passes the diagnostic tests for serial correlation, normality, functional form, and heteroscedasticity.

Figure 7.8 and Figure 7.9 show the plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ).

Figure 7.8: CUSUM for Tanzania

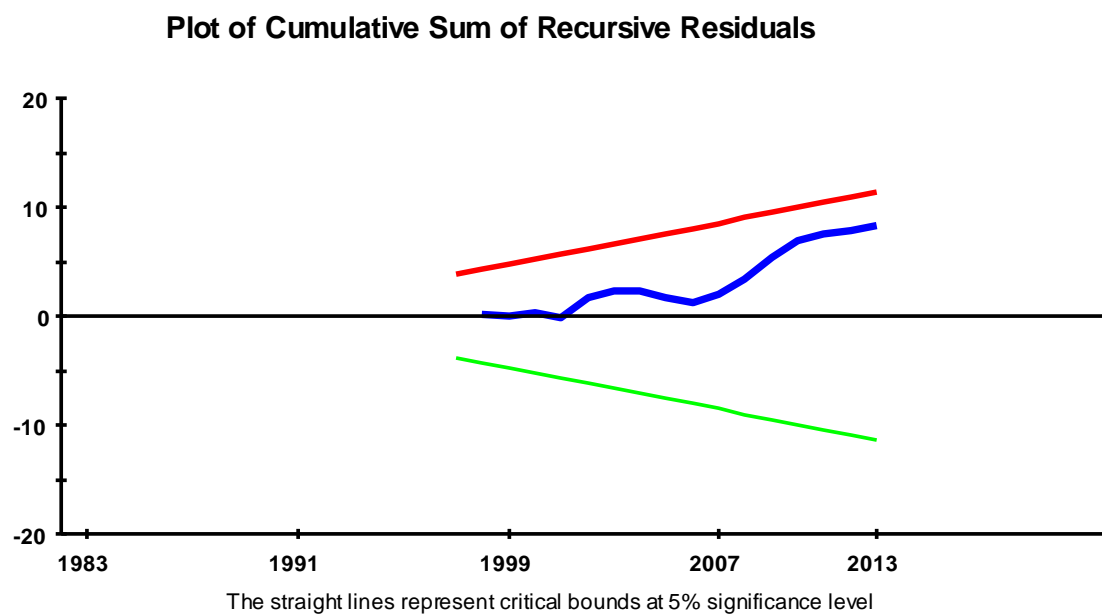


Figure 7.9: CUSUMQ for Tanzania

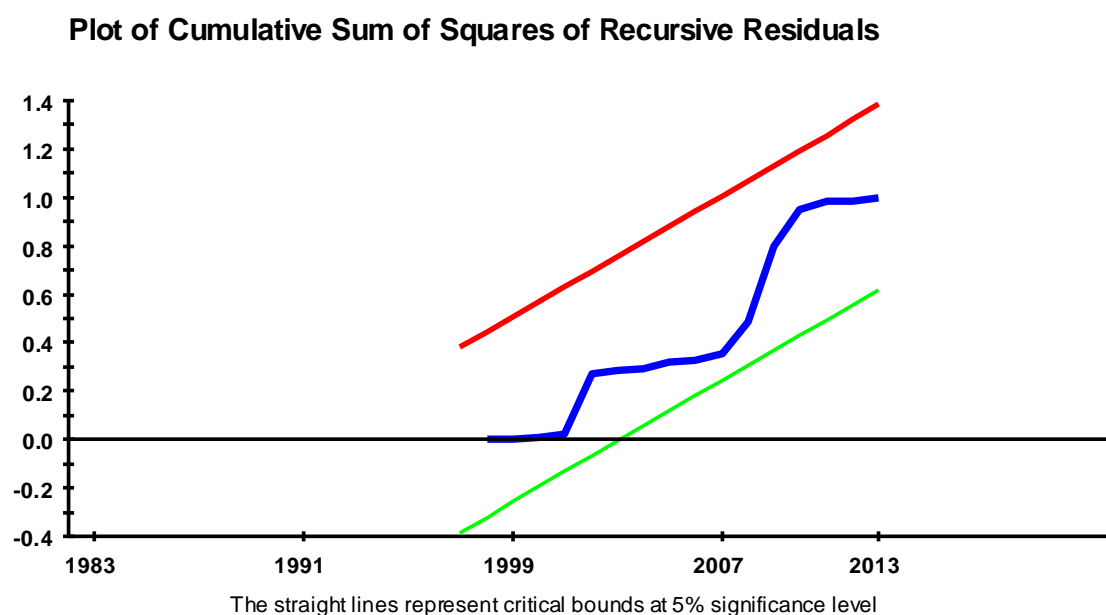


Figure 7.8 and Figure 7.9 show that the plots of CUSUM and CUSUMQ are within the 5% critical lines, revealing that the model is stable and confirms the stability of the long-run coefficients of the regressors.

7.4.3 Summary of Findings for Tanzania

Section 7.4 uses the autoregressive distributed lag (ARDL) to examine monetary policy and economic growth nexus in Tanzania. The results confirm long-run monetary policy neutrality – Irrespective of whether money supply or interest rate is used as a proxy for monetary policy. The short-run results, on the other hand, confirm neutrality of monetary policy only when interest rate is used as a proxy for monetary policy. When interest rate is used as proxy for monetary policy, a negative effect of monetary policy on economic growth is found to prevail. There was no established impact of inflation on economic growth in the short run, suggesting no role of monetary policy in the short run.

7.5 Conclusion

The chapter examined the impact of monetary policy on economic growth in Uganda, Kenya, and Tanzania using the recently developed ARDL bounds testing approach by Pesaran and Shin (1999), due to its unique advantages over small samples. Two monetary policy variables, namely money supply (M2) and short-term interest rate (91-day Treasury bill rate) were utilised. The results are as follows:

- i. For Uganda- money supply has both a long-run and short-run impact on economic growth. The findings also reveal that interest rate has a positive impact on economic growth in the short run, but not in the long run.
- ii. For Kenya- both long-run and short-run empirical results confirm no impact of both money supply and interest rate on economic growth.
- iii. For Tanzania- the results confirm long-run monetary policy neutrality – irrespective of whether money supply or interest rate is used as a proxy for monetary policy. The short-run results, on the other hand, confirm neutrality of monetary policy only when interest rate is used as a proxy for monetary policy. When interest rate is used as proxy for monetary policy, a negative effect of monetary policy on economic growth is found to prevail.

CHAPTER EIGHT

8. CONCLUSION AND POLICY RECOMMENDATIONS

8.1 Introduction

This chapter concludes the study and underscores the main findings and conclusions while highlighting policy implications contingent to the country-specific findings and areas for further research. The chapter is organised into five sections. Section 8.2 presents a brief summary of the study. Section 8.3 discusses in brief, the main findings and policy implications of the study, while Section 8.4 highlights the limitations and identifies areas for further research.

8.2 Summary of the Study

The study set out to examine the impact of monetary policy on economic growth in East Africa, focusing primarily on the original EAC partners – Uganda, Kenya and Tanzania. The study was motivated, in part, by limited and scarce empirical literature on this linkage and the controversies within the existing literature. Given that all the three countries remain low income countries, understanding the growth drivers from the short term policy framework, monetary policy remains imperative amidst the controversial empirical findings. The thesis provides an exploratory review of each country's economic, monetary and financial reforms – since their respective independence in the early 1960s. At the time, in all the three countries, monetary policy was conducted under the East African Currency Board (EACB) until the set-up of the respective central banks (1965-1966). The exploratory country chapters also describe the economic and monetary performance over the years; and highlight the challenges facing the conduct of monetary policy.

The review of the existing relevant literature on monetary and economic growth has revealed that the majority of the findings support the relevance of monetary policy in supporting economic growth, mainly in financially developed economies with fairly independent central banks. The relationship tends to be weaker in developing economies with undeveloped financial markets and weakly integrated to global markets. However, the empirical literature has mainly focused quantity-based monetary policy (money supply) and economic growth, particularly on the long-run impact. The literature on price-based (interest rate) monetary policy impact on economic growth remains unclear and limited particularly for developing countries. The results are also varied depending on the monetary instruments, size and financial sector deepening, competition with the financial sector, the monetary and exchange rate regimes, as well as the openness of the respective economies.

The thesis makes a contribution by empirically examining the long-run and short-run impact of monetary policy on economic growth in Uganda, Kenya and Tanzania. Unlike most previous studies, this study uses two monetary policy instruments (interest rate and money supply) in the empirical growth model. Other control variables of inflation, exchange rate, trade openness, and gross fixed capital formation are also used. In pursuance of the empirical task of examining the impact of monetary policy on economic growth, this study used the autoregressive distributed lag (ARDL) bounds testing approach to cointegration because of its profound advantages over the traditional co-integration techniques, particularly for small samples like the one used in this study (1983 to 2013). To my knowledge, this study may be the first of its kind to examine in detail the impact of monetary policy on economic growth using ARDL bounds testing approach.

8.3 Summary of the Empirical Findings and Policy Implications

The overall empirical findings of this study reveal that the impact of monetary policy on economic growth is not unanimous. The results are country variant, and depend on the monetary policy variable used. The results also varied over time.

The empirical results for Uganda show that money supply has a positive and significant impact on economic growth, both in the short run and the long run. Contrary to the study expectations, interest rate has a positive impact on economic growth in the short run. In the long run, however, the results indicate that interest rate has no impact on economic growth. Therefore, the results imply that long-run monetary policy neutrality on economic growth applies when the interest rate is used as a monetary variable.

For Kenya, the empirical results reveal no impact of money supply on economic growth, both in the short run and long run. This supports both short-run and long-run monetary policy neutrality on economic growth. The empirical results also reveal no impact of monetary policy on economic growth both in the short run and the long run when interest rate is used as a monetary policy variable. This revelation of short-run monetary policy neutrality on economic growth is divergent from the expected findings.

The empirical results for Tanzania indicate no impact of money supply on economic growth both in the short run and long run irrespective of the proxy used to measure monetary policy. This also supports the existence of long-run monetary policy neutrality on economic growth. However, in the short run, contrary to study expectations, interest rate has no impact on economic growth – indicative of the existence of short-run monetary policy neutrality on economic growth. When money supply is used to measure monetary policy, a negative relationship between monetary policy and economic growth is found to predominate.

The other results indicate that investment has a positive and significant effect on economic growth both in the short run and long run in all the three countries. Also, inflation is found to have a positive impact on economic growth in the long run in the three countries, which is contrary to the *a priori* expectation. Trade openness has a positive effect on economic growth in the long run and negative effect in the short run in Kenya. Real exchange rate has a negative effect on economic growth in both short run and long run in Uganda. As expected, real exchange rate has a positive effect on economic growth in Tanzania but only in the short run.

In conclusion, the empirical findings of the monetary policy on economic growth are not homogenous across the study countries. In Uganda, the study has established a positive impact of money supply on economic growth both in the short run and in the long run. Therefore, this study recommends the use money supply as the appropriate monetary policy instrument for Uganda. However, when interest rate is used as a monetary policy variable, interest rate has a positive impact on economic growth in the short run consistent with previous studies by Dele (2007), Rafiq and Mallick (2008), Chaudhry *et al.* (2012) and Ivrendi and Yildirim (2013).

This study also finds that monetary policy has no impact on economic growth both in the short run and in the long run in Kenya irrespective of the monetary policy variable used. This study, therefore, suggests that both money supply and interest rate based monetary policies may not be a panacea for economic growth in Kenya.

In Tanzania, the empirical results reveal no impact of money supply and interest rate on economic growth in the long run. This is consistent with this study's findings for Kenya. However, in the short run, money supply has a negative impact on economic growth while interest rate has no impact on economic growth in Tanzania. This study, therefore, suggests that both money supply and interest rate based monetary policies may not be a panacea for economic growth Tanzania as it has been empirically proven by the results.

The empirical results also find inflation to have a positive impact on economic growth in the long run in the three countries, which is contrary to the *a priori* expectation. These findings also discount the conventional notion that monetary policy by attaining price stability would spur economic growth. Investment is found to have a positive impact on economic growth both in the short run and in the long run in all the three countries. Therefore, the study recommends that measures to promote both public and private investments should be put in place in order to stimulate economic growth.

8.4 Limitations of the Study and Areas for Further Research

Although all efforts were made to make this study analytically defensible, it may suffer from a few limitations, happens to be the case with many other scientific research studies.

The study may have suffered from the lack of high frequency data. Higher frequency data is impeccably relevant for central bank policy research as monetary policy is the first line of defence to economic shocks. All EAC countries only recently started compiling real GDP on a quarterly basis. The most reliable and sufficient data set available was on an annual basis. However, even on an annual basis, the data availability was varied across countries and the best available small sample size was from 1983 to 2013 for all the countries. The study also had to drop one of the primary variables– labour force because of the availability of a few data points. It is imperative that this study's findings are compared against results from future research that use high frequency data in the event that such studies occur.

The study also relied on only two proxies of monetary policy (money supply and interest rate) and may not have reflected holistically the monetary policy dynamics. Some future studies could apply alternative monetary policy proxies including monetary policy indices, then compare and contrast their results to this study's findings.

Future studies may also benefit from capturing financial system indicators in the analytical framework since there is growing literature on its likely impact on the speed and impact of monetary policy on economic growth.

Overall while there is room for improvement in prospective studies, the findings of this study remain empirically sound.

BIBLIOGRAPHY

Abuka, C. A. and Egesa, K. A. (2007) 'An assessment of private sector credit evolution in the East African Community: The candidates for a region wide reform strategy for the financial sector.' *The Bank of Uganda Staff Papers Journal*, 1(2):36-77.

Adam, C. (2009) 'The conduct of monetary policy in Uganda: an assessment.' *Economic Policy Research Centre Research Series*, 65.

Adam, C., Maturu, B., Ndung'u, N., and O'Connell, S. (2010a) 'Building a monetary regime for the 21st Century.' In C. Adam, P. Collier, and N. Ndung'u (Eds.), *Kenya: policies for prosperity*. Oxford: Oxford University Press.

Adam, C., Kessy, P. Nyella, J. J. and O'Connell, S. A. (2010b) 'The demand for money in Tanzania.' *International Growth Center (IGC) Working Paper*. [Online] Available from: <http://www.theigc.org/project/the-demand-for-money-in-tanzania/> [Accessed: 14 April 2014].

Adar, K. G. (2011) 'The democratization of international organizations: East African Community.' *International Development Watch*.

Akinlo, A. E. (2005) 'Impact of macroeconomic factors on total factor productivity in Sub-Saharan African Countries.' *World Institute for Development Economics Research*, 39.

Aliyev, R. (2012) 'Monetary policy in resource-rich developing economies.' *Center for Economic Research and Graduate Education-Economics Institute*. [Online] Available from: <http://www.cerge-ei.cz/pdf/wp/Wp466.pdf> .[Accessed: 15 April 2014]

Al-Mashat, R. and Billmeier, A. (2007) 'The monetary transmission mechanism in Egypt.' *International Monetary Fund Working Paper*, 285. Washington, D.C.

Amarasekara, C. (2009) 'The impact of monetary policy on economic growth and inflation in Sri Lanka.' *Central Bank of Sri Lanka, Staff Studies*, 38:1-44.

Ando, A. and Modigliani, F. (1963) 'The life cycle hypothesis of saving: Aggregate implications and tests.' *The American Economic Review*, 53(1):55-84. March.

Andrle, M. A., Berg, A., Berkes, E., Morales, R., Portillo, R., Vavra, D., and Vleck, J. (2013) 'Forecasting and policy analysis systems in Low Income Countries: The role of money targeting in Kenya.' *International Monetary Fund Working Paper*, 239. Washington, D.C.

Anyanwu, J. C. (2014) 'Factors affecting economic growth in Africa: Are there any lessons from China?' *African Development Review*, 26(3):468-493.

Arestis, P. (2007) 'What is the New Consensus in Macroeconomics?' In P. Arestis (Ed.), *Is There a New Consensus in Macroeconomics*, 22-42. New York: Palgrave Macmillan.

Arestis, P. (2009) 'New Consensus in macroeconomics: A critical appraisal.' *University of Cambridge*.

Arestis, P. and Sawyer, M .C. (2008) 'A critical reconsideration of the foundations of monetary policy in the New Consensus macroeconomic framework.' *Cambridge Journal of Economics*, 32(5):761-779.

Asongu, S. A. (2014) 'A note on the long-run neutrality of monetary policy: New empirics.' *European Economics Letters*, 3(1):1-6.

Atingi-Ego, M., and Sebudde, K. R. (2000) 'Uganda's equilibrium real exchange rate and its implication for non-traditional export performance.' *The Bank of Uganda Staff Papers Journal*, 2(1).

Backhouse, R. E. and Bateman, B. W. (2011) 'On post Keynesian economics and the economics of Keynes.' *Mimeo*, June.

Bagliano, F. C. and Favero, C. A. (1998) 'Measuring monetary policy with VAR models: An evaluation.' *European Economic Review*, 42:1069-1112.

Balogun, D. E. (2008) 'An alternative reconsideration of macroeconomic convergence criteria for West African Monetary Zone.' *Munich Personal RePEc Archive Paper*, 11367. October.

Banerjee, A., Dolado, J. J. and Mestre, R. (1998) 'Error-correction mechanism tests for cointegration in a single-equation framework.' *Journal of Time Series Analysis*, 19: 267-283.

Bank of Tanzania (2011) *Tanzania mainland's 50 years of independence: A review of the role and functions of the Bank of Tanzania (1961-2011)*. June. [Online] Available from: <http://www.bot.go.tz/Adverts/PressRelease/2011-Nov-04-PressRelease.pdf>. [Accessed: 13 January 2014].

Bank of Tanzania (2013). *Monetary policy statement 2013/14*. June. [Online] Available from: <http://www.bot.go.tz/Publications/PublicationsAndStatistics.asp#RegularPublications> [Accessed: 13 January 2014].

Bank of Tanzania (2014) *Annual financial stability report*. March. [Online] Available from: <http://www.bot.go.tz/Publications/PublicationsAndStatistics.asp#RegularPublications>. [Accessed: 13 January 2014].

Bank of Uganda. (2012) *Annual supervision report*. December. [Online] Available from: <https://www.bou.or.ug/bou/bou-downloads/asr/2012/Dec/Annual-Supervision-Report-2012.pdf>. [Accessed: 02 July 2014].

Bank of Uganda. (2013a). *Annual financial stability report*. Issue, 5. June. [Online] Available from: https://www.bou.or.ug/bou/bou-downloads/financial_stability/Rpts/All/Financial-Stability-Report- Issue-5 -June-2013.pdf. [Accessed on 2 July 2014].

Bank of Uganda. (2013b). *Annual report for financial year 2012/13*. [Online] https://www.bou.or.ug/bou/bou-downloads/publications/Annual_Reports/Rprts/All/Annual-Report-2012-2013.pdf.

Accessed: 02 July 2014].

Bank of Uganda. (2014). *BoU statistics*. [Online] Available from: https://www.bou.or.ug/bou/rates_statistics/statistics.html. [Accessed: 27 December 2014].

Barakchian, S. M. and Crowe, C. (2013) 'Monetary policy matters: Evidence from new shocks data.' *Journal of Monetary Economics*, 60:950-966.

Barro, R. and Sala-i-Martin, X. (1995) *Economic growth*. McGraw-Hill, New York.

Barro, R. J. (1976) 'Rational expectations and the role of monetary policy.' *Journal of Monetary Economics*, 2:1-32.

Barro, R. J. (1997) *Determinants of economic Growth: A cross-country empirical study*. The MIT Press, Cambridge, Massachusetts.

Barro, R. J. (2003) 'Determinants of economic growth in a panel of countries.' *Annals of Economics and Finance*, 4:231-274.

Barungi, B. M. (1997) 'Exchange rate policy and inflation in Uganda.' *African Economic Research Consortium Research Paper*, 59.

Bategeka, L. and Okumu, J. L. (2010) 'Banking sector liberalisation in Uganda process, results and policy options.' *Centre for Research on Multinational Corporations*. Netherlands.

Batini, N., Harrison, R. and Millard, S. P. (2001) 'Monetary policy rules for an open economy.' *Bank of England Working Paper*, 149. Bank of England.

Batini, N., Kuttner, K. and Laxton, D. (2005) 'Does inflation targeting work in emerging markets?' *In world economic and financial surveys: World Economic Outlook*. Washington D. C. September. [Online] Available from: <https://www.imf.org/external/pubs/ft/weo/2005/02/pdf/chapter4.pdf>. [Accessed: 15 May 2014].

Beirne, J., Hunter, J. and Simpson, M. (2007) 'Is the real exchange rate stationary? The application of similar tests for a unit root in the univariate and panel cases.' *Qualitative and quantitative analysis in the social sciences*, 1(2):55-70.

Belke, A. and Polleit, T. (2009) *Monetary economics in a globalized financial markets*. London: Springer Dordrecht Heidelberg.

Berg, A., Mirzoev, T., Portillo, R. and Zanna, L. (2010) 'The short-run macroeconomics of aid inflows: understanding the interaction of fiscal and reserve policy.' *International Monetary Fund Working Paper*, 65. Washington, D.C.

Berg, A., Charry, L., Portillo, R. and Vlcek, J. (2013) 'The monetary transmission mechanism in the Tropics: A narrative approach.' *International Monetary Fund Working Paper*, 197. Washington, D.C.

Bernanke, B. S., Boivin, J., and Elias, P. (2005) 'Measuring the effects of monetary policy: A factor-augmented vector autoregressive (FAVAR) approach.' *The Quarterly Journal of Economics*, 120(1):387-422.

Bernanke, B. S. and Gertler, M. (1995) 'Inside the black box- the credit channel of monetary policy transmission.' *Journal of Economic Perspectives*, 9(4):27-48.

Bernanke, B. S. and Mihov, I. (1998) 'Measuring monetary policy.' *The Quarterly Journal of Economics*, 113(3):869-902.

Bernanke, B. S. (2010) 'Central bank independence, transparency, and accountability.' *Speech delivered at the Institute for Monetary and Economic Studies International Conference*, Bank of Japan. Tokyo. May 26. [Online] Available from:

<https://www.federalreserve.gov/newsevents/speech/bernanke20100525a.pdf>.

[Accessed: 26 March 2014].

Bird, A. (2003) 'Design and Implementation features of Medium-term expenditure frameworks and their Links to Poverty reduction: Chapter 7.' *Overseas Development Institute*, London. May.

BIS, (2008) 'Transmission mechanisms of monetary policy in emerging markets.' *The Bank of International Settlements*, 35.

Blaug, M. (1996) *Economic theory in retrospect*. 5th ed. Cambridge University Press.

Boivin, J., Kiley, M. T., Mishkin, F. S. (2010) 'How has the monetary transmission mechanism evolved over time?' *Finance and economics discussion series, Federal Reserve Board*, 26.

Bordon, A. R. and Weber, A. (2010) 'The transmission mechanism in Armenia: New evidence from a regime switching VAR analysis.' *International Monetary Fund Working Paper*, 270.

Brownbridge, M. (1996a). Financial repression and financial reform in Uganda. *Institute of Development Studies Working Paper*. [Online] Available from: <https://www.ids.ac.uk/files/Wp30.pdf> [Accessed on 8 March 2014].

Brownbridge, M. (1996b) 'Government policies and the development of banking in Kenya.' *Institute of Development Studies Working Paper*, 29. May.

Brownbridge, M. and Tumusiime-Mutebile, E. (2007) 'Aid and fiscal deficits: Lessons from Uganda on the implications for macroeconomic management and fiscal sustainability.' *Development Policy Review*, 25(2):193-213.

Brunner, K. and Meltzer, A. H. (1972) 'Money, debt and economic activity.' *Journal of Political Economy*, 80:951-977.

Buigut, S. (2009) *Monetary policy transmission mechanism: Implications for the proposed East African Community (EAC) Monetary Union*. [Online] Available from: <http://www.csae.ox.ac.uk/conferences/2009-EdiA/paperlist.html>. [Accessed: 26 January 2014].

Buigut, S. (2010) 'Is there a bank lending channel of monetary policy in Kenya?' *International Research Journal of Finance and Economics*, 45:182-191.

Bullard, J. (1999) 'Testing long-run neutrality propositions: Lessons from the recent research.' *Federal Reserve Bank of St. Louis Review*, 81(6):57-78.

Cagan, P. (1989). 'Monetarism.' In J.Eatwell, M. Milgate, and P. Newman (Eds.). *The Palgrave: money*: 195-205. London and Basingstoke: The Macmillan Press Limited.

Calvo, G. A. (1983) 'Staggered prices in a utility-maximizing framework.' *Journal of Monetary Economics*, 12:383-398.

Capistrano, C. and Timmermann, A. (2009) 'Disagreements and biases in inflation expectations.' *Journal of Credit, Money and Banking*, 41(2):365-396.

Central Bank of Kenya (2010). *Annual report*. [Online] Available from: <https://www.centralbank.go.ke/index.php/cbk-annualreports>. [Accessed: 14 December 2013].

Central Bank of Kenya (2013a) *Annual report*. [Online] Available from: <https://www.centralbank.go.ke/index.php/cbk-annualreports>. [Accessed: 04 May 2014].

Central Bank of Kenya (2013b). *Annual financial stability report*. June. [Online] Available from: <https://www.centralbank.go.ke/index.php/news/378-financial-2013-report>. [Accessed: 04 May 2014].

Central Bank of Kenya (2013c) *Annual supervision report*. [Online] Available from: <https://www.centralbank.go.ke/index.php/bank-supervision-reports>. [Accessed: 04 May 2014].

Central Bank of Kenya (2014) *CBK statistics*. [Online] Available from: <https://www.centralbank.go.ke/#>. [Accessed: 04 May 2014].

Chari, V. V., Kehoe, P. J. and McGrattan. E. R. (2008) 'New keynesian models: Not yet useful for policy analysis.' *NBER Working Paper Series*, 14313. Cambridge, MA: National Bureau of Economic Research.

Chaudhry, I. S., Qamber, Y. and Farooq, F. (2012) 'Monetary policy, inflation and economic growth in Pakistan: Exploring the co-integration and causality relationships.' *Pakistan Journal of Commerce and Social Science*, 6(2):332-347.

Cheng, K. C. (2006) 'A VAR analysis of Kenya's monetary policy transmission mechanism: How does the central bank's REPO rate affect the economy?' *International Monetary Fund Working Paper*, 300. Washington, D.C.

Chinn, M. D. and Ito, H. (2008) 'A new measure of financial openness.' *Journal of Comparative Policy Analysis*, 10:309-22.

Chinn, M. D. and Ito, H. (2015) *The Chinn-Ito index– A de jure measure of financial openness*. [Online] Available from: http://web.pdx.edu/~ito/Chinn-Ito_website.htm. [Accessed: 15 July 2015].

Christiano, L. J., Eichenbaum, M. and Evans. C. L. (1999) 'Monetary policy shocks: What have we learned and to what end?' In John B. Taylor and Michael Woodford, (eds.) *Handbook of Macroeconomics*, 1A. Amsterdam: Elsevier Sci.

Cihak, M. and Podpiera, R. (2005) 'Bank behaviour in developing countries: Evidence from East Africa.' *International Monetary Fund Working Paper*, 129.

Clarida, R., Gali, J. and Gertler, M. (1999) 'The science of monetary policy: A New Keynesian perspective.' *Journal of Economic Literature*, 37(4):1661-1707.

Clarida, R., Gali, J. and Gertler, M. (2001) 'Optimal monetary policy in open versus closed economies: an integrated approach.' *American Economic Review*, 91(2):248-252.

Coricelli, F., Égert, B. and MacDonald, R. (2006) 'Monetary transmission mechanism in Central and Eastern Europe: Gliding on a wind of change.' *William Davidson Institute Working Paper*, 850.

Courchene, T. J. and Harris, R. G. (1999) 'From fixing to monetary union: Options for North American currency integration.' *C.D. Howe Institute Commentary*, 127 (Toronto).

David, A. (2008) 'Macroeconomic theory and policy.' *Munich Personal RePEc Archive*, 2: 1-210.

Davoodi, H., Dixit, S. and Pinter, G. (2013) 'Monetary transmission mechanism in the East African Community: An empirical investigation.' *International Monetary Fund Working Paper*, 39. Washington, D.C.

De Nicoló, G., Honohan, P., Ize, A. (2003) 'Dollarization of the banking system: Good or bad?' *World Bank Policy Research Working Paper*, 3116, August.

Dele, B. E. (2007) 'Monetary policy and economic performance of West African monetary zone countries.' *Munich Personal RePEc Archive*, 4308.

Dhungana, S. (2008) 'Capital account liberalization and growth volatility.' *Williams College*, mimeo.

Di Castri, S. and Gidvani, L. (2014) 'Enabling mobile money policies in Tanzania: A test and learn approach to enabling market-led digital financial services.' [Online] Available from: <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/03/Tanzania-Enabling-Mobile-Money-Policies.pdf>. [Accessed: 30 May 2014].

Dickinson, D. and Liu, J. (2007). 'The real effects of monetary policy in China: An empirical analysis.' *China Economic Review*, 18(1):87-111.

Dimand, R. W. and Durlauf, S. N. (2009) 'James Tobin and growth theory: Financial factors and long-run growth.' *History of Political Economy*, 41.

Dincer, N. N. and Eichengreen, B. (2014) 'Central bank transparency and independence: Updates and new measures.' *International Journal of Central Banking*. 10(1). March.

Domar, E. D. (1946) 'Capital expansion, rate of growth, and employment.' *Econometrica*, 14(2):137-147

Dornbusch, R., Fischer, S. and Startz, R. (2012) *Macroeconomics*. 10th edition, New Delhi, Mcgraw Hill Education (India) Pvt. Ltd.

Drummond, P., Aisen, A., Alper, E., Fuli, E. and Walker, S. (2015) 'Toward a Monetary Union in the East African Community: Asymmetric shocks, exchange rates, and risk-sharing mechanisms.' *International Monetary Fund*, Africa department. [Online] Available from: <https://www.InternationalMonetaryFund.org/external/pubs/ft/dp/2015/afr1506.pdf> [Accessed: 02 February 2016]

Elliott, G., Rothenberg, T. J. and Stock, J. H. (1996) 'Efficient tests for an autoregressive unit root.' *Econometrica*, 64: 813-36.

Engle, R. F. and Granger, C. J. (1987) 'Cointegration and error-correction representation, Estimation and testing.' *Econometrica*, 55(2):251-278.

Evans, P. (1996) 'Growth and the neutrality of money.' *Empirical Economics*, 21: 187-202.

Fasanya, O. and Onakoya, A. B. O. (2013) 'Does monetary policy influence economic growth in Nigeria?' *Asian Economic and Financial Review*, 3(5):635-646.

Fernald, J., Spiegel, M. M. and Swanson, E. (2013) 'Monetary and fiscal policy effectiveness in China: Evidence from a FAVAR Model.' *Federal Reserve Bank of San Francisco*, December.

Fielding, D. and Gibson, F. (2012) 'Aid and Dutch disease in sub-Saharan Africa.' *World Institute of Development Economics Research Working Paper*, 26.

Financial Sector Deepening Kenya and Central Bank of Kenya. (2013) *Fin access national survey*. [Online] Available from: http://fsdkenya.org/wp-content/uploads/2015/08/13-10-31_FinAccess_2013_Report.pdf [Accessed on 13 June 2014].

Financial Sector Deepening Trust. (2013) *FinScope Tanzania*. [Online] Available from: <http://www.fsd.or.tz/wp-content/uploads/2016/05/FinScope-Brochure-2013-Summary-2.pdf> [Accessed: 11 July 2014].

Fischer, S. (2005) *IMF Essays from a time of crisis: The international financial system, stabilization, and development*. MIT Press Books. The MIT Press.

Floden, M. (2000) 'Endogenous monetary policy and business cycle.' *European Economic Review*, 44:1409-1429.

Fontana G. (2010) 'The return of Keynesian economics: A contribution in the spirit of John Cornwall's Work.' *Review of Political Economy*, 22(4):517-533.

Fontana G. and Palacio-Vera, A. (2007) 'Are long-run price stability and short-run output stabilisation all that monetary policy can aim for?' *Metroeconomica*, 58(2):269-298.

Fosu, E. O. A. and Magnus, F. J. (2006) 'Bounds testing approach to cointegration: An examination of foreign direct investment trade and growth relationships.' *American Journal of Applied Sciences*, 3(11):2079-2085.

Friedman, M. (1956) 'The quantity theory of money: A restatement.' In Friedman, M. (ed.). *Studies in the quantity theory of money*. Chicago: University of Chicago Press: 3-21.

Friedman, M. and Schwartz, A. (1963a) 'Money and business cycles.' *Review of Economics and Statistics*: 32-64. February.

Friedman, M. and Schwartz, A. J. (1963b) 'A Monetary history of the United States, 1867-1960.' *Princeton University Press for the Munich Personal RePEc Archive*, Princeton.

Friedman, M. (1968) 'The role of monetary policy.' *American Economic Review*, 58(1):1-17.

Friedman, M. and Schwartz, A. J., (1970) 'Monetary statistics of the United States: Estimates, sources, methods.' *Columbia University Press for the Munich Personal RePEc Archive*, New York.

Galbraith, J. (2008) 'The collapse of monetarism and the irrelevance of the New Monetary Consensus.' *The Levy Economics Institute*.

Gali, J. (2008) 'Monetary Policy, inflation and the business cycle.' *Princeton University Press*.

Gertz, G. (2009). *Kenya's trade liberalization of the 1980s and 1990s: Policies, impacts, and implications*. *Carnegie Endowment for International Peace*. [Online] Available from: http://www.carnegieendowment.org/files/impact_doha_kenya.pdf. [Accessed: 04 May 2014].

Geweke, J. (1986) 'The superneutrality of money in the United States: An interpretation of the evidence.' *Econometrica*, 54:1-21. January.

Gomes, O. (2006) 'Monetary policy and economic growth: Combining short and long run macro analysis.' *Munich Personal RePEc Archive*, 2849.

Goodfriend, M. and King, R. G. (1997) 'The new neoclassical synthesis and the role of monetary policy.' *Munich Personal RePEc Archive, Macroeconomics Annual*, 12:231-283.

Goodfriend, M. (2004) '*Understanding the transmission of monetary policy- China's monetary policy transmission mechanism.*' Presented at Joint People's Bank of China - International Monetary Fund high level seminar, Beijing. May.

Goodhart, C. A. E. (1989) *Money, information and uncertainty*. Cambridge, M.A. The MIT Press.

Goodhart, C (2012) 'Monetary policy and public debt.' *Financial Stability Review*, Banque de France. April.

Gottschalk, J. (2005) '*Monetary policy and German unemployment problem in macroeconomic models: Theory and evidence.*' Berlin German, Springer-Verlag Berlin Heidelberg.

Grace Li, B., O'Connell, C., Adam, C., Berg, A. and Montiel, P. (2016) 'VAR meets DSGE: Uncovering the monetary transmission mechanism in Low-Income Countries.' *International Monetary Fund Working Paper*, 90. Washington, D.C.

Gujarati, D. N. (1995) *Basic Econometrics, third edition*. McGraw Hill, New York.

Gujarati, D. N. (2003) *Basic Econometrics*. New York: McGraw Hill Book Co.

Haddad, M. and Pancaro C. (2010) 'Can real exchange rate undervaluation boost exports and growth in developing countries? Yes, but not for long.' *Economic Premise*, 20, World Bank PREM Network, June.

Hammond, G. Kanbur, R. and Prasad, E. S. (2009) 'Monetary policy for Emerging Markets.' *Brookings Global Economy and Development Working Paper*, 36. August.

Harris, R. G. (2000) 'The new economy and the exchange rate regime.' *Presented at a conference in honour of Robert A. Mundell at the John Deutsch Institute for the Study of Economic Policy*, Queen's University.

Harrison, A. (1996) 'Openness and growth: A time-series, cross-country analysis for developing countries.' *Journal of economic development*, 48(2):419-447.

Hayashi, F. 2000. *Econometrics*. Princeton University Press, Princeton and Oxford.

Heintz, J. and Ndikumana, L. (2010) 'Is there a case for formal inflation targeting in sub-Saharan Africa?' *Political Economy Research Institute University of Massachusetts Amherst*, 218. March.

Hicks, J. R. (1937) 'Mr Keynes and the classics: a suggested interpretation.' *Econometrica*, 5:147-159.

Honohan, P. and Beck. T. (2007). *Making Finance Work for Africa*. World Bank, Washington, DC.

Hossain, A. (2014) 'Monetary policy, inflation, and inflation volatility in Australia.' *Journal of Post Keynesian Economics*, 36:745-780.

Huang, H. and Wei, S. J. (2006) 'Monetary policies for developing countries: The role of institutional quality.' *Journal of International Economics*, 70(1):239-52.

International Financial Statistics. (2014) *IMF data*. [Online] Available from: <http://www.imf.org/en/Data> [Accessed: 02 June 2014].

International Monetary Fund. (1995) 'Kenya recent economic developments.' *Country Report*, No. 133. December. Washington D.C.

International Monetary Fund. (2010) 'Uganda-first review under the policy support instrument.' *International Monetary Fund Country Report*, 248.

International Monetary Fund. (2013a) 'Uganda-first review under the Policy Support Instrument.' *International Monetary Fund Country Report*, 375, December. Washington, D.C.

International Monetary Fund. (2013b) *Annual report on exchange arrangements and exchange restrictions*. Washington D.C.

International Monetary Fund. (2013c) 'Kenya-sixth and final review under the three-year arrangement under the extended credit facility.' *Country Report*, 358, December. Washington D.C.

International Monetary Fund. (2014a) *Regional Economic Outlook: Sub-Saharan Africa*. Washington D.C. April.

International Monetary Fund. (2014b) 'Tanzania the third review under the standby credit facility arrangement.' *International Monetary Fund Country Report*, 120.

International Monetary Fund. (2014c) *World Economic Outlook*. Washington, D.C. April.

International Monetary Fund. (2016) *Regional Economic Outlook: Sub-Saharan Africa*. Washington D.C. April.

Ireland, P. N. (2005) 'The monetary policy transmission mechanism.' *Poston College and Munich Personal RePEc Archive*. October.

Issing, O. (2001). 'Why Price Stability.' In A. Garcia-Herrero, V. Gaspar, L. Hoogduin, J. Morgan and B. Winkler (eds.), *Why Price Stability?* European Central Bank, Frankfurt am Main.

Ivrendi, M., and Guloglu, B. (2010) 'Monetary shocks, exchange rates and trade balances: Evidence from inflation targeting countries.' *Economic Modelling*, 27:1144–1155. [Online] Available from: <http://ideas.repec.org/a/eee/ecmode/v27y2010i5p1144-1155.html>. [Accessed: 31 June 2014].

Ivrendi, M. and Yildirim, Z. (2013). 'Monetary policy shocks and macroeconomic variables: Evidence from fast growing emerging economies.' *Economics Discussion Papers*, No. 61, *Kiel Institute for the World Economy*. [Online] Available from: <http://www.economics-ejournal.org/economics/discussionpapers/2013-61>. [Accessed: 13 April 2015].

Johansen, S. (1988) 'Statistical analysis of cointegration vectors.' *Journal of Economic Dynamics and Control*, 12(2-3):231-254.

Johansen, S. (1991) 'Estimation and hypothesis testing of cointegration vectors in gaussian vectorautoregressive models.' *Econometrica*, 59(6):1551-1580.

Johansen, S., and Juselius, K. (1990) 'Maximum likelihood estimation and inference on cointegration - with applications to the demand for money.' *Oxford Bulletin of Economics and Statistics*, 52(2):169-210.

Kamaan, C, K. (2014) 'The effect of monetary policy on economic growth in Kenya.' *International Journal of Business and Commerce*, 3(8). April.

Kasekende L. A. (2001) 'Capital account liberalisation: The Ugandan experience.' *Development Policy Review*, 19(1):101-120.

Kasekende, L. and Atingi-Ego, M. (1996) 'Implication of financial sector liberalization on the domestic financial system.' *African Economic Research Consortium Research Paper*, 18. Nairobi.

Kenya Institute for Public Policy Research and Analysis (2013). *Kenya economic report: Creating an enabling environment for stimulating investment for competitive and sustainable counties*. [Online] Available from: <http://kippra.or.ke/downloads/Kenya%20Economic%20Report%202013.pdf> [Accessed: 04 April 2014].

Kessy, P. (2011) 'Dollarisation in Tanzania: Empirical evidence and cross-country experience.' *International Growth Centre Working paper*. April. [Online] Available from:

<https://www.theigc.org/wp-content/uploads/2014/09/Kessy-2011-Working-Paper.pdf>.

[Accessed on 17 April 2014]

Keynes, J. M. (1936) *The general theory of employment, interest and money*. Macmillan, London.

Khabo, V. and Harmse, C. (2005) 'The impact of monetary policy on economic growth of a small open economy: The case of South Africa.' *SAJEMS NS*, 8(3):348–362.

Khan, A., Qayyum, A. and Sheikh, S. (2005) 'Financial development and economics growth: The case of Pakistan.' *The Pakistan Development Review*, 44:819–837.

Khan, M. S. (2010) 'The design and effects of monetary policy in sub-Saharan African Countries.' *Journal of African Economies*, 20, African Economic Research Consortium Supplement, 2: 16–35.

Khan, M. S. and Senhadji, A. S. (2001) 'Threshold effects in the relationship between inflation and growth.' *International Monetary Fund Staff Papers*, 48(1):1–21. Washington, D.C.

Killick, T. and Mwega, F. M. (1990) 'Monetary policy in Kenya 1967-1988.' *Overseas Development Institute Working Paper*, 39.

Kim, S. (1999) 'Do monetary policy shocks matter in the G-7 countries? Using common identifying assumptions about monetary policy across countries.' *Journal of International Economics*, 48(2):387-412

Kinyua, J. K. (2001) 'Monetary policy in Kenya: Evolution and current framework.' *Central Bank of Kenya*.

Knoop, A. T. (2008) *Modern financial macroeconomics: Panics, crashes, and crises*. Oxford: Blackwel Publishing.

Kohpaiboon, A. (2004) 'Foreign trade regime and FDI-growth nexus: A case study of Thailand.' *Australian National University Working Paper*.

Krause, S. and Rioja, F. (2006). Financial development and monetary policy efficiency. [Online] Available from: http://www.banque-france.fr/fileadmin/user_upload/banque_de_france/publications/Bulletin-de%20la-Banque-de-France/krause_06_13_paper.pdf [Accessed: 12 June 2014].

Kuteesa, F., Magona, I., Wanyera, M. and Wokadala, J. (2006) 'Uganda: A decade of budget reform and poverty reduction.' *Organisation for Economic Co-operation and Development Journal on Budgeting*, 6(2):1-25.

Kutesa, F. Tumusiime-Mutebile, E., Whitworth, A. and Williamson, T. (2010) *Uganda's economic reforms. Insider accounts*. Oxford University Press.

Kydland, F. W. and Prescott, E. C. (1977) 'Rules rather than discretion: The inconsistency of optimal plans.' *Journal of Political Economy*, 85(3):473-491.

Kydland, F. E. and Prescott, E. C. (1982) 'Time to build and aggregate fluctuations.' *Econometrica*, 50(6):1345-1370.

Lane, P. R. and Milesi-Ferretti, M. G. (2006) 'The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities 1970-2004.' *International Monetary Fund Working paper*, 69. Washington D.C. March.

Leijonhufvud, A. (1968) 'Keynes and the effectiveness of monetary policy.' *Economic Inquiry*, 6(2):97-111.

Leijonhufvud, A. (2009) 'Macroeconomics and the crisis: A personal appraisal.' *Centre for Economic Policy Research Policy Insight*, 41. November.

Levine, R. and Renelt, D. (1992) 'A sensitivity analysis of cross-country growth regressions.' *American Economic Review*, 82(4):942-63.

Loayza, N. and Schmidt-Hebbel, K. (2002) 'Monetary policy functions and transmission mechanisms: An overview.' *Central Bank of Chile*. Santiago.

Lucas, R. E. (1972) 'Expectations and the neutrality of money.' *Journal of Economic Theory*, 4:103-124.

Lucas, R. E. (1987) *Models of business cycles*. Oxford, Basil Blackwell.

Lucas, R. E. (2003) 'Macroeconomic priorities.' *American Economic Review*, 93(1):1-14.

Maehle, N., Teferra, F. and Khachatryan, A. (2013) 'Exchange rate liberalization in selected Sub-Saharan African Countries: Successes, failures, and lessons.' *International Monetary Fund working paper*, 32. Washington D.C.

Mallik, G. and Chowdhury, A. (2001) 'Inflation and economic growth: Evidence from four South Asian Countries.' *Asia-Pacific Development Journal*, 8(1):123-135.

Mankiw, G. (2006) 'The macroeconomist as scientist and engineer.' *Journal of Economic Perspectives*, 20(4): 29-46.

Mankiw, N. G. (2010) *Macroeconomics*. 7th Edition, New York, Worth Publishers.

Mankiw, G. N. and Taylor, M. P. (2007) *Macroeconomics*. European Edition ed. Basingstoke: Palgrave Macmillan.

Mankiw, N. G., Romer, D., Weil, D. N. (1992) 'A contribution to the empirics of economic growth.' *Quarterly Journal of Economics*, 107(2):407-437.

Mansouri B. (2005) 'The interactive impact of FDI and trade openness on economic growth: Evidence from Morocco.' *Paper presented at the 12th Economic Research Forum (ERF) Conference*, Cairo.

Maturu, B., Maana, I. and Kisinguh, K. (2010) 'Monetary policy transmission mechanism in Kenya: A VAR approach.' *Central Bank of Kenya Working Paper*.

McCandless, G. T. and Weber, W. E. (1995) 'Some monetary facts.' *Federal Reserve Bank of Minneapolis Quarterly Review*, 19(3):2-11.

Meltzer, A. H. (1969) 'Money, intermediation and growth.' *Journal of Economic Literature*, VII, August.

Mester, L. J. (2015) 'Long-run economic growth. New York University Stern.' *Center for Global Economy and Business*, New York, October. [Online] Available from: <https://www.clevelandfed.org/newsroom-and-events/speeches/sp-20151015-long-run-economic-growth.aspx> [Accessed: 3 December 2015].

Mikkelsen, J. and Peiris, J. S. (2005) 'Uganda: selected issues and statistical appendix.' *International Monetary Fund Country Report*, 172. Washington D.C.

Milani, F. and Treadwell, J. (2012) 'The effects of monetary policy news and surprises.' *Journal of Money, Credit and Banking*, 44(8).

Misati, R. N., Njoroge, L., Kamau, A., and Ouma, S. (2010) 'Financial innovation and monetary policy transmission in Kenya.' [Online] Available from: <http://www.eurojournals.com/finance.htm> [Accessed: 7 January 2014].

Mishkin, F.S. (1995) 'Symposium on the monetary transmission mechanism.' *Journal of Economic Perspectives*, 9(4):3-10.

Mishkin F. S. (2004) 'Can inflation targeting work in emerging market countries?' *A Presentation at the International Monetary Fund Festschrift in Honour of Guillermo A. Calvo*, Washington: 15-16. April.

Mishkin, F. S. (2007a) 'Will monetary policy become more of a science?' *Munich Personal RePec Archive Working Paper*, 13566.

Mishkin, F. S. (2007b) 'The transmission mechanism and the role of asset prices in monetary policy.' In F. S. Mishkin (Ed.), *Monetary Policy Strategy*: 59-74. Cambridge: The MIT Press.

Mishkin, F. and Schmidt-Hebbel, K. (2001) 'One decade of inflation targeting in the world: What do we know and what do we need to know?' *National Bureau of Economic Research Working Paper*, No. 8397. July. Cambridge, M. A.

Mishra, P., Montiel, P., and Spilimbergo, A. (2010) 'Monetary transmission in Low Income Countries.' *International Monetary Fund Working Paper*, 223. Washington D.C.

Mishra, P., Montiel, P., and Spilimbergo, A. (2012) 'Monetary transmission in Low-Income Countries: Effectiveness and policy implications.' *International Monetary Fund Economic Review*, 60: 270-302.

Mlachila, M., Park, S. G., and Yabara, M. (2013) 'Banking in sub-Saharan Africa: The macroeconomic context.' In P. de Lima, S. Zajc, A. Schumacher, and Schmitz, R. *Banking in sub-Saharan Africa –challenges and opportunities*: 6-27. Brussels: European Investment Bank.

Monojit, C., Sushil, M. and Sayantan, G. D. (2013) 'Relationship between trade openness and economic growth of India: A time series analysis.' *University of Dundee Discussion Papers in Economics*, 274.

Monteil, P., Adam, C., Mbowe, W., and O'Connell, S. (2012) 'Financial architecture and the monetary transmission mechanism in Tanzania.' *Centre for the Study of African Economies Working Paper*, 3. Mimeo.

Montiel, P. (2013) 'The Monetary transmission mechanism in Uganda.' *International Growth Centre Working Paper*, mimeo.

Morales, R. (2012) 'Monetary policy harmonization in the East African Community.' In H.Davoodi (Ed.), *The East African Community after ten years. Deepening integration. International Monetary Fund*. [Online] Available from: <https://www.InternationalMonetaryFund.org/external/np/afr/2012/121712.pdf>. [Accessed: 28 May 2014].

Morekwa, M.E., Sichei, M.M.,and Mutai,N.K. (2007) 'The monetary and fiscal policy interaction in Kenya.' *Central Bank of Kenya*.

Mostafavi, M. (2012) 'A comparative study between ARDL and Johansen procedures in narrow money estimation in the Iranian economy.' *Quarterly Journal of Quantitative Economics*, 8(4).

Moursi, T, A. and El Mossallamy, M. (2010) 'Monetary policy analysis with New Keynesian Models for Egypt.' *Information and Decision Support Center (IDSC) of the Egyptian Cabinet Working Paper*.

Mtchallo, I. A. J. (1994) 'The impact of structural adjustment programmes on the natural resource base: The case of tourism development.' *UTAFITI (New Series)*, 1(2). [Online] Available from: <http://pdfproc.lib.msu.edu/?file=/DMC/African%20Journals/pdfs/Utafiti/vol1no2NS/aejpNS001002007.pdf> [Accessed on 20 March 2014]

Mugume, A. (2006) 'Market Structure and Performance in Uganda's Banking Industry.' [Online] Available from: <http://www.africametrics.org/documents/conference07/Day%202/Session%206/Mugume%20market%20strutcure.pdf> [Accessed: 23 March 2014].

Mugume, A. (2011) 'Monetary transmission mechanisms in Uganda.' *Bank of Uganda Working Paper*. [Online] Available from: <http://www.bou.or.ug/bou/home.html>. [Accessed:17 January 2014].

Mukherjee, S. and Bhattacharya, R. (2011) 'Inflation targeting and monetary policy transmission mechanisms in Emerging Market Economies.' *International Monetary Fund Working Paper*, 229. October.

Musinguzi, P. and Katarikawe, M. (2000) 'Monetary policy frameworks in Africa: The case of Uganda.' *Bank of Uganda*. [Online] Available from: <https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/57/Uganda.pdf> [Accessed: 21 December 2013].

Mutaitina, O. R. (1999) 'Liberalisation of the banking industry in Tanzania: Issues and prospect.' *African Journal of Finance and Management*, 7(2):98-113.

Ndulu, B. (1987) 'Structural adjustment policies and programmes: Case study Tanzania.' *World Institute for Development Economics Research for the United Nations University*.

Ngugi, R. W. (2001) 'An empirical analysis of interest rate spread in Kenya.' *African Economic Research Consortium Research Paper*, 106. May.

Nogueira, R. P. (2009) 'Is monetary policy really neutral in the long-run? Evidence for some emerging and developed economies.' *Economics Bulletin*, 29(3):2432-2437.

Nord, R., Sobolev, R., Dunn, D., Hajdenberg, A., Hobdari, N., Maziad, S. and Roudet, S. (2009) 'The story of an African transition Tanzania.' *International Monetary Fund*. Washington, D.C.

Nourzad, F. (2002) 'Real money balances and production efficiency: A panel data stochastic production frontier study.' *Journal of Macroeconomics*, 24:125-134.

Noyer, C. (2007) 'Financial innovation, monetary policy and financial stability.' *Spring Conference of the Bank of France/Deutsche Bundesbank, Eltville, Germany*, April.

Nyamwongo, E. and Ndirangu, L. (2013) 'Financial innovations and monetary policy in Kenya.' *Munich Personal RePEc Archive Paper*, 52387.

Nyerere, J. K. (1977) 'The Arusha Declaration, Ten years after.' [Online] Available from: <http://www.tzonline.org/pdf/thearushadeclarationtenyearsafter.pdf>. [Accessed:10 June 2014].

O'Connell, S. A., Maturu, B. O., Mwega, F. M., Ndung'u, N. S. and Ngugi, R. W. (2010) 'Capital mobility, monetary policy, and exchange rate management in Kenya.' In Adam, Collier and Ndung'u, eds (2010) *Policies for prosperity*. Oxford University Press:172-210.

Odhiambo, N. M. (2011) 'The Impact of financial liberalisation in developing countries: Experiences from four SADC Countries.' *Organisation for Social Science Research in Eastern and Southern Africa (OSSREA)*.

Opolot, J. (2007) 'A re-examination of the demand for money in Uganda: Nature and implications for monetary policy.' *Bank of Uganda Staff Papers Journal*.

Opolot, J. Nampewo, D, Ntumwa, C. A. and Nyanzi, S. (2013) 'Financial architecture and monetary policy transmission mechanisms in Uganda.' *Bank of Uganda Working Paper, 2*.

Palley T. I. (2007) 'Macroeconomics and monetary policy: Competing theoretical frameworks.' *Journal of Post Keynesian Economics*, 30(1):61-78.

Papademos, L. (2003) 'Economic cycles and monetary policy.' *Paper presented at the International Symposium of the Banque de France on Monetary Policy, Economic Cycle and Financial Dynamics*, Paris. March.

Pesaran, M. H. and Shin, Y. 1999 'An autoregressive distributed lag modelling approach to cointegration analysis.' In: Storm, S. (Ed.) *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*, Cambridge University Press, Chapter 11: 1-31.

Pesaran, M. H., Shin. Y. and Smith, R. (2001) 'Bounds testing approaches to the analysis of level relationships.' *Journal of Applied Econometrics*, 16(3):289-326.

Pollin, R. and Zhu, A. (2006) 'Inflation and economic growth: A cross-country nonlinear analysis.' *Journal of Post Keynesian Economics*, 28(4):593-614.

Prasad, E. and Rajan, R. (2008) 'A pragmatic approach to capital account liberalization.' *National Bureau of Economic Research Working Paper*, 14051.

Prasad, N. (2013) 'Sterilized interventions and capital Controls.' Mimeo.

- Rafiq, M. S. and Mallick, S. K. (2008) 'The effect of monetary policy on output in EMU3: A sign restriction approach.' *Journal of Macroeconomics*, 30:1756–1791.
- Rebelo, S. (1987) 'Long-run policy analysis and long-run growth.' *Journal of Political Economy*.
- Rey, H. (2013) 'Dilemma not trilemma: The global financial cycle and monetary policy independence.' *Paper prepared for the Jackson Hole Symposium*, August 23-25.
- Robinson, J. (1962) 'Review of Johnson (1962).' *Economic Journal*, 72:690-702.
- Rodrik, D. (2008) 'The real exchange rate and economic growth.' *Brookings Papers on Economic Activity*, 39(2):365-439.
- Romer, D. (2006) *Advanced macroeconomics. (3rd Ed.)*. New York: McGraw-Hill/Irwin.
- Romer, P. M. (1989) 'Capital accumulation in the theory of long-run growth.' In R.Barro ed. *Modern Business Cycle Theory*. Cambridge M. A: Harvard University.
- Romer, P. M. (1994) 'The origins of endogenous growth.' *Journal of Economic perspectives*, 8(1):3-22.
- Rono, K, J. (2002) 'The impact of the structural adjustment programmes on Kenyan society.' *Journal of social development in Africa*, 17(1).
- Rotemberg, J. J. and Woodford, M. (1997) 'An optimization-based econometric framework for the evaluation of monetary policy.' *Munich Personal RePEc Archive Macroeconomics Annual*, 12:297-346.
- Rudd, J and Whelan, K. (2006) 'Can rational expectations stick price models explain inflation dynamics?' *American Economic Review*, 96(1):303-320.
- Rutasitara, L. (2004) 'Exchange rate regimes and inflation in Tanzania.' *African Economics Consortium Research Paper*, 138.

Sakyi, D. (2011) 'Trade openness, foreign aid and economic growth in post-liberalization Ghana: An application of ARDL bounds test.' *Journal of Economics and International Finance*, 3(3):146-156.

Sarkar, S. (2008) 'Trade openness and growth: is there any link?' *Journal of Economic Issues*, 42(3).

Sargent, T.J. (1973) 'Rational expectations, the real rate of interest, and the natural rate of unemployment.' *Brookings Papers on Economic Activity*, 2:429-472.

Saxegaard, M. (2006) 'Excess liquidity and effectiveness of monetary policy: Evidence from Sub-Saharan Africa.' *International Monetary Fund Working Paper*, 115. Washington D.C.

Schwartz, A. J. (2009) 'Origin of the financial market crisis of 2008.' In P.Booth (Ed.), *Verdict on the Crash: Causes and policy implications*: 45-50. London. The Institute of Economic Affairs.

Sichei, M. and Kamau, A. (2012) 'Demand for money: Implications for the conduct of monetary policy in Kenya.' *International Journal of Economics and Finance*, 4(8):72-82.

Smets, F. and Wouters, R. (2007) 'Shocks and frictions in U.S. business cycles: A bayesian DSGE approach.' *American Economic Review*, 97(3):586-606.

Smith, A. (1776) *An inquiry into the nature and causes of the wealth of nations*. London: W. Strahan.

Smith, C. (2004) 'The long-run effects of monetary policy on output growth.' *Reserve Bank of New Zealand Bulletin*, 67(3).

Snowdon, B. and Vane, H. (2005) 'Modern macroeconomics, its origin, development and current state.'

Solow, R. (1956) 'A contribution to the theory of economic growth.' *Quarterly Journal of Economics*, 70(1):65–94.

Solow, R. M. (1957) 'Technical change and the aggregate production function.' *Review of Economics and Statistics*, 39:312–320.

Starr, M. (2005) 'Does money matter in the CIS? Effects of monetary policy on output and prices.' *Journal of Comparative Economics*, 33:441-461.

Sturgill, B. (2014) 'Money growth and economic growth in developed nations: An empirical analysis.' *Journal of Applied Business and Economics*, 16(4).

Sueyoshi, A. (2010) 'An empirical and theoretical literature review on endogenous growth in Latin American Economies.' *Faculty of International Studies, Utsunomiya University*, 29:35-48.

Swammy, G. (1994) *Kenya structural adjustment in the 1980s. World Bank Chief Economists Office, Africa Regional Office.* [Online] Available from: <http://documents.worldbank.org/curated/en/771151468774952469/pdf/multi0page.pdf> [Accessed on 5 January 2014].

Swan, T. W. (1956) 'Economic growth and capital accumulation.' *Economic Record*, 32: 334-361.

Szpunar P. and Głogowski, A. (2012) 'Systemic risk lessons from foreign currency loans in Europe.' *Macro-Prudential Commentaries*, Issue, 4.

Taylor, J. (1995) 'The monetary transmission mechanism: An empirical framework.' *Journal of Economic Perspective*, 9(4):11-26.

Tobin, J. (1965) 'Money and economic growth.' *Econometrica*, 33:671–684.

Tobin, J. (1970) 'Money and income: Post hoc ergo propter hoc?' *The Quarterly Journal of Economics*, 84(2):301-317. May.

Tumusiime-Mutebile, E. (2010) *The Road to Monetary Union in East Africa. Keynote address at the Validation Workshop of the Draft Final Report of the Monetary Union Study: 18-20 January 2010, Kampala.* [Online] Available from: [https://www.bou.or.ug/bou/bou-downloads/speeches/GovernorsSpeeches/2010/Jan/Monetary Union in East Africa Keynote Address.pdf](https://www.bou.or.ug/bou/bou-downloads/speeches/GovernorsSpeeches/2010/Jan/Monetary_Union_in_East_Africa_Keynote_Address.pdf) [Accessed: 11 November 2013].

Tumusiime-Mutebile, E. (2012) *Basic principles guiding monetary policy in Uganda. Speech by Governor of the Bank of Uganda, at the annual dinner of Uganda's Bankers' Association.* BIS central bankers' speeches. [Online] Available from: <http://www.bis.org/review/r130115c.pdf> [Accessed: 3 December 2013].

Uganda Bureau of Statistics. (2014) *UBoS statistics.* [Online] Available from: <http://www.ubos.org/statistics/macro-economic/> [Accessed: 27 December 2014].

United Nations Conference on Trade and Development. (2013) *World Investment Report Global Value Chains: Investment and Trade for Development.* [Online] Available from: http://unctad.org/en/PublicationsLibrary/wir2013_en.pdf [Accessed: 30 October 2014].

Vinayagathan, T. (2013) 'Monetary policy and the real economy: A Structural VAR approach for Sri Lanka.' *National Graduate Institute for Policy Studies*, 13(13).

Walsh, C. E. (2003) *Monetary theory and policy.* Cambridge, Massachusetts: The MIT Press.

Weber A. (2007) 'Hedge funds: A central bank perspective.' *Financial Stability Review, Special Issue on Hedge Funds*, 10: 101-168. April. Banque de France.

Weeks, J. (2010) 'Why monetary policy is irrelevant in Africa south of the Sahara.' *Centre for Development Policy and Research, School of Oriental and African Studies*, 53. June.

Weil, D., Mbiti, I. and Mwega, F. (2012) 'The implications of innovations in the financial sector on the conduct of monetary policy in East Africa.' *International Growth Centre Working Paper*, 12/0460. Tanzania Country Program. [Online] Available from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.259.7015&rep=rep1&type=pdf>. [Accessed: 10 July 2014].

White, W. R. (2013) 'Is monetary policy a science? The interaction of theory and practice over the last 50 years.' *Globalization and Monetary Policy Institute Working Paper*, 155. Federal Reserve Bank of Dallas.

Williamson, T., Davies, F., Aziz, I. and Hedger, E. (2016) 'Budget support to Uganda 1998-2012: A review.' *Overseas Development Institute Briefing Papers*. [Online] Available from: <https://www.odi.org/publications/10328-budget-support-uganda-1998-2012-review> [Accessed: 9 March 2016]

Woodford, M. (2003) *Interest and prices: Foundations of a theory of monetary policy*. Princeton University Press, Princeton.

Woodford, M. (2007) 'The case of forecast targeting as monetary policy strategy.' *Journal of economic perspectives*, 21(4):3-24.

World Bank. (2012). *World Bank DataBank. World Development Indicators*. [Online] Available from <http://databank.worldbank.org/data/databases.aspx> [Accessed: 10 December 2013].

World Bank. (2013). *World Bank DataBank. World Development Indicators*. [Online] Available from <http://databank.worldbank.org/data/databases.aspx> [Accessed: 12 July 2014].

World Bank. (2014). *World Bank DataBank. World Development Indicators*. [Online] Available from <http://databank.worldbank.org/data/databases.aspx> [Accessed: 14 June 2014].

World Bank. (2015). *World Bank DataBank. World Development Indicators*. [Online] Available from <http://databank.worldbank.org/data/databases.aspx> [Accessed: 20 February 2016].

Yilmazkuday, H. (2013) 'Inflation thresholds and growth.' *International Economic Journal*, 27(1): 1-10.